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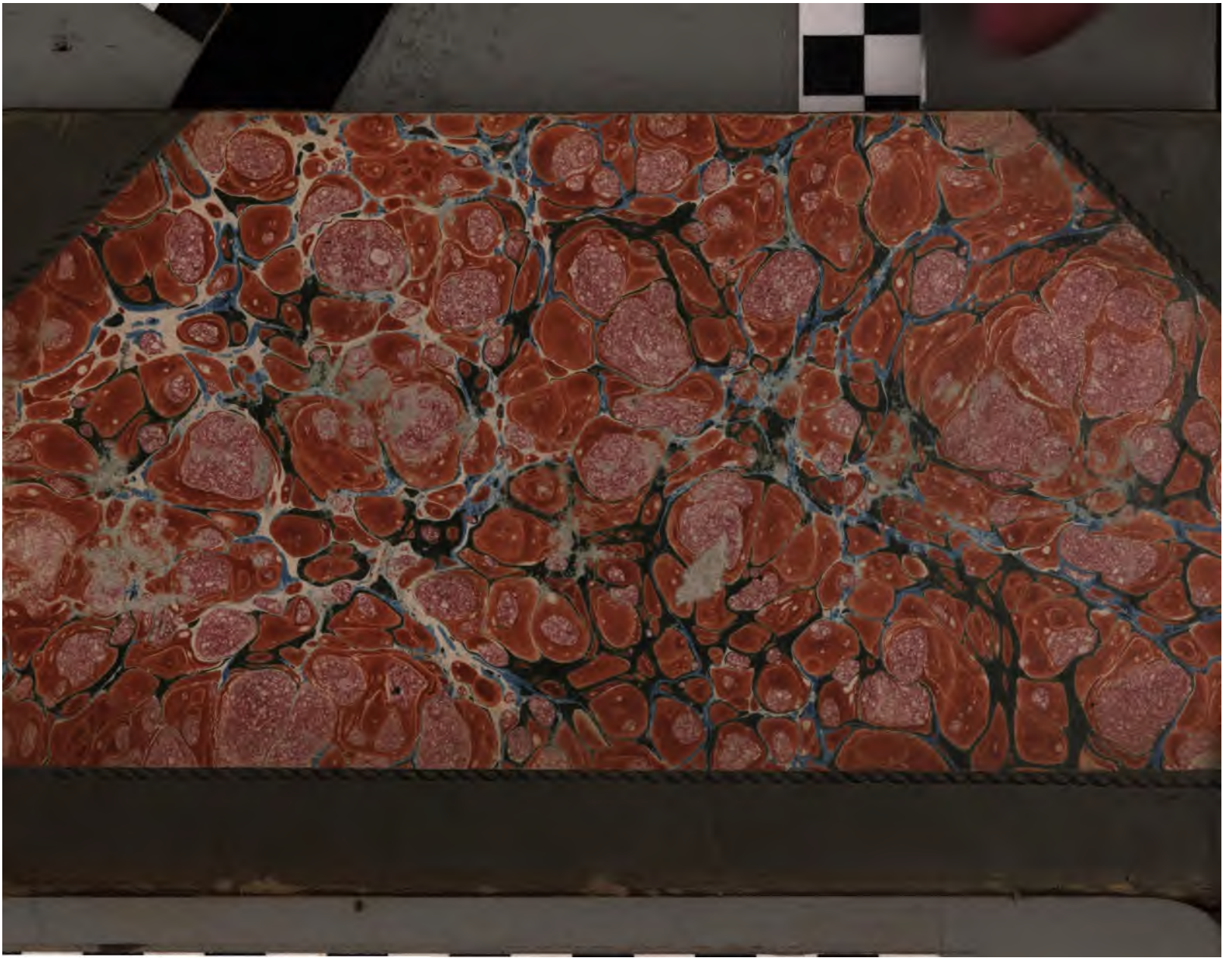

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GREAT CHESNUT TREE ON MOUNT ETNA.

S.H. 1810

MISCELLANEOUS REPORTS

ON

WOODS

AND

PLANTATIONS,

SHEWING A METHOD TO PLANT, REAR, AND RECOVER ALL WOODS, PLANTATIONS AND TIMBER TREES ON EVERY SOIL AND SITUATION IN BRITAIN AND IRELAND;

CONTAINING

Demonstrative Proof of the great Profits to be derived from Planting; means of ascertaining the comparative Tanning principles of all kinds of Barks;

WITH

Plans for employing the Operatives, and improving the Waste Lands of Great Britain and Ireland.

IN A LETTER TO

THE RIGHT HON. ROBERT PEEL,

SECRETARY OF STATE.

BODLEIANA

By ROBERT MONTEATH,

DESIGNER AND VALUATOR OF WOODS AND PLANTATIONS,

AUTHOR OF THE FORESTER'S GUIDE AND PROFITABLE PLANTER.

DUNDEE:

PRINTED AND SOLD BY JAMES CHALMERS;

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1827.

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TO

THE RIGHT HONOURABLE

THE EARL OF CARLISLE,

CHIEF COMMISSIONER OF WOODS AND FORESTS,

&c. &c.

THE ENLIGHTENED PATRON OF AGRICULTURE

AND SCIENCES;

THE FOLLOWING PRACTICAL TREATISE IS,

BY PERMISSION,

MOST RESPECTFULLY DEDICATED BY HIS

LORDSHIP's MOST FAITHFUL AND

VERY HUMBLE SERVANT,

ROBERT MONTEATH.

Edinburgh, 29th. June, 1827.

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GREAT CHESNUT TREE ON MOUNT ETNA.

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GREAT CHESNUT TREE ON MORTLAKE GREEN

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would suit the wishes of those of our countrymen who prefer the home of their fathers to a foreign shore; while the other would form an outlet of escape for those more adventurous spirits, who see in the unoccupied expanse of a new country the proper sphere for their enterprise and activity to figure in. The effect of the one as well as of the other, would just be, in so far at least, to lift from off the groaning soil the burthen of its starving population.

One thing is never to be forgotten, in reference to any plan that may be proposed for the employment of the people. It is not, in fact, employment that is wanted for its own sake, but employment as a means of creating subsistence merely. This is the test by which we ought to try the pretentions of every project that may be suggested in reference to this matter. We have already applied the principle in question to Lord Elgin's trenching scheme. If the return arising from that operation will not pay the cost occasioned by it, it were merely to throw away so much of the national funds, or the public charity, to contribute any sum of money for its encouragement. If the effect of expending in that way an additional pound sterling upon every acre, shall merely be to raise an additional ten shillings worth of produce, we should clearly act far more wisely in at once devoting our money to the purchase of double that quantity of produce abroad. We should not in that manner certainly give *employment* to so many of our countrymen, but what is much better, we should give *subsistence* to twice as many of them. Just in a similar way do we estimate the value of these schemes of Mr. Monteath and Mr. Lindsay. It is not because it would set a working so many thousands or tens of thousands of our idle population, that we would have our waste lands planted; but simply because the real value of the work would more than pay the cost of it, and would thus enable us to give to our operatives bread for their mouths, as well as mere

occupation for their hands. And as for the land which Mr. Lindsay proposes to recover from the sea, it is obvious that it will only be a real accession to the resources of the kingdom, if it shall be able to produce a certain quantity of grain for a smaller sum of money than would suffice to procure an equal quantity in any other way. If the scheme do not promise this much it least, it is worth nothing. It could never, of course, be expected that Government should devote any part of the public money to so preposterous an enterprize, as that would be, of cultivating land, obtained either in this way or in any other, at a greater expense than the produce promised to repay. Mr. Lindsay, we do not doubt, at least believes himself abundantly able to prove that the plan he has laid before the public does not involve any such absurdity as we are here refering to.

The late Lord Meadowbank, in his interesting publication in 1815, has the following very spirited and judicious remark:— "Were the Highland proprietors to set about establishing a proper cultivation in their vast domians, they would soon be amply rewarded by the rising value of their property; and would no longer suffer the disgrace of urging emigration, by their short sighted projects of improvement, that high-spirited and noble race of men, who, by their interpidity and self-devotement to national glory, have raised their reputation to a level with Spartan fame." I wonder what his Lordship would now have said on the proposed plan of emigration, while there is still such a want of improving spirit amongst the proprietors of the waste lands of Scotland and Ireland.*

* I am of opinion his Lordship would say: Let the British Government improve their waste lands and populate the thousands of miles of almost desolate counties at home in the first place. I recollect the time when passengers and goods were often 6 or 8 days betwixt Greenock and Rothsay, about 20 miles; now the conveyance is four times a day, and not above two hours. By the detention of a Packet I once paid threepence for the twopenny loaf, at Inverary. In these times many places of the Highlands of Scotland were not worth cultivating; but now the conveyance by steam to all parts has altered the case.

QUERIES AND ANSWERS.

The following Queries were sent me for Replies by J. F. Burke, Esq. Greenwich. It was not till after I had replied to them that I understood their design was to establish a Joint Stock Planting Company. I considered it for the use of private property, and answered them as intended for some large landed proprietor's estate.

Query I.—The plan to be pursued in establishing a general Nursery of Forest Trees for all the soils, with the time and probable expense?

Answer.—There are three different soils mentioned in your Letter; but as the climate and situation may be nearly the same; two roods, say half an acre, will be sufficient to rear plants of every description for planting 100 acres annually, if once established; to effect which, select a Nursery as near a-kin to the different soils as possible; to save expense of enclosing, one spot may do for the whole; which, in the first place must be properly enclosed, not only to keep out cattle and sheep, but game of every kind. For this purpose, a stone fence is the most permanent, safest, and speedist brought to be effectual. If stones could be got in the neighbourhood, a fence of five feet high would be sufficient, and could be done at from 6s. to 7s. 6d. per rood. Next to this, is a hedge, and paling to protect it, as it cannot be a fence without it, it will cost from 4s. to 6s. per rood; but requires a little yearly cleaning and keeping. The ground should be trenched over during the summer months, and properly prepared for receiving the seed or seedlings early in spring. I would recommend filling it with seedlings, as being both cheaper and easier managed; about L.100 will fill it up at first, with a sufficient number of seedlings, and from L.40 to L.50 for seedlings annually, will keep a sufficient

quantity of every description for planting out 100 acres yearly. Thus a sufficient number of plants of every description may be obtained for planting 100 acres, at an expense not exceeding 10s. per acre.

QUERY II.—Three different enumerations of the plants most proper for each soil. The expense of planting and fencing in large enclosures. The probable period and value of the thinings, and the annual charges of management; this calculation being with a view to ascertain the earliest probable return from the soil?

ANSWER.—On light sandy soils, the Larch and the Spruce, of the Fir tribe, can be reared, and will come to maturity as timber trees. If the sub-soil is of light sand and not very deep, and turning to clay below, the Scotch Elm, Ash, and Plane, of the hard wood tribe, will come to maturity as timber trees; and the Oak for Coppice, if the soil is once made by the Larch Firs, as described in my Forester's Guide, will do extremely well when properly managed. On the gravelly clays, &c. the Oak, Spanish Chesnut, and the Scotch Elm (which is next to the Oak, and is used for Shipbuilding,) will come to maturity as timber trees. After the Nursery is established, the expense of plants and planting each acre with all kinds, will be from 22s. to 30s. The expenses of enclosing will be as in reply to Qurey First; say from 6s. to 7s. 6d. if with stone; and hedge, &c. from 4s. 6d. to 6s. per rood. If the plantation be in large clusters, the enclosing will be very trifling per acre; if they are detached in small clusters, the expense will be the greater; but the exact expense will be easily ascertained by measuring the line of fence round the different plantations. I have, however, seen some plantations, when of considerable extent, enclosed at the rate of 5s. per acre; there is often a great saving by judiciously laying off the enclosures. The Nursery, enclosing the wood-land, and planting, will require a proper skilful manager

to superintend the work, &c. which will cost at least L.60 annually. If a plantation of Firs, if the situation is much exposed, they must be planted at distances of four feet, plant from plant; at ten years, thinned out to eight feet, which suppose wholly of Larch, as the bark is in considerable request, will bring, after paying the expense of thinning, from L.5 to L.7 per acre; at twenty years, thinned out to sixteen feet, at which distance Larch may stand till forty years old; which thinnings at twenty years, will pay at least L.25 per acre. As it is to be understood the worst and dwarfish trees are always to be taken; the crop on the ground at twenty years will be worth fully that amount. At forty years old, when the Larch Firs is fit for almost any purpose as timber, and if the growths are ordinary good, will average at least twenty feet a-tree, will be worth L.300 per acre. If planted with Oaks, to be converted into a natural Oak Coppice, cut over from the plant at fifteen years old; supposing Oak Bark to sell at L.14 per ton, the first cutting will bring from L.30 to L.40 per acre; and for every twenty or twenty-four years after cuttings, from L.100 or L.150 per acre. This may vary a little according as the ground may not in every acre of it carry the number of plants, trees, or stools without blanks. By having yearly cuttings, very ordinary wood-lands will pay an annual rent of from L.5 to L.10 per acre, from natural Oak, for any length of time without the expense of planting, but keeping good the fences, —and Firs by planting every forty years.

Query III.—The probable value of the standing timber at distant periods, specifying those at which it would be the fittest for the Naval Yards?

Answer.—To rear timber for the Naval Yards; having planted Oak, Spanish Chesnut, and Scotch Elm, the only kinds in general use for the Navy, at eight feet distant, plant from plant; at fifteen years, thin out to sixteen feet, taking care always to take out the worst of the plants or trees, dressing up the

roots or stools of those cut for the growth. The timber and bark produced from the cuttings at this time will pay from L.7 to L.10 per acre; at thirty years old, thin out to thirty-two feet, tree from tree, always dressing up the cuttings for the growth; the thinnings at thirty years will pay at least L.25 per acre. The trees at thirty-two feet may be reared up to eighty years old, when they will be good timber trees fit for shipbuilding, say from one to two tons of timber each. It may be here proper to observe, that many of the growths from the trees cut over at fifteen years of age, will at the age of forty have made more progress than those from the original plant; so that some of them may be reared with greater advantage and propriety as shipbuilding timber trees, and can also be made to grow more crooked if attended to. By this method a crop of shipbuilding timber trees fit for naval purposes, can, after the first sixty years, be always keept upon the ground; at the same time, when the plantations are of any extent, even granting it were only one hundred acres less or more, a part can be always cut down every year for the Naval Yards; and part of them reared up without any expense of replanting, perpetually. The value of an acre of Oak, Spanish Chesnut, and Elm trees, as above, at sixty years old, may be fairly reckoned at or nearly L.400; besides, the cuttings from the natural under-wood will have paid a rent of not less than L.3 per acre annually, leaving always a crop of timber trees fit for naval purposes rearing on the ground, reckoning the timber, including bark of such trees, at five shillings per cubical foot; but this price may vary a little according as the locality of the plantation may be to a market or sea carriage.

Having given you a statement of the probable expense of planting, rearing, and reaping of an acre in its different stages, it will serve for any number of acres, on such soils, &c.

N. B.—If there are neither stones nor timber on the Estate, or in the neighbourhood fit for enclosing, the most economical

method would be to plant immediately (although the plants were to be bought in,) a few acres wholly with Larch Firs; or if in marshy or wet places, with the common Willow, as these will come up in the course of a very short time, to afford a sufficient supply of paling for enclosing 500 acres, year after year. If necessary to have recourse to this method of enclosing, the Larch may be planted at two feet six inches, and the Willows at two feet, plant from plant. I have known Willows fit for paling in three, and Larch in six years. If recourse is to be had wholly to a wooden fence, the paling recommended in my Forester's Guide will be found the most sufficient, permanent, and cheapest. I have been using cast-iron bolts, which I find astonishingly cheap ultimately.

Sir,—I now send you a Reply to the Queries in your Letter of the 22nd. February, which, however trifling, I am sorrow to say, from my engagements on different Estates through Scotland preparatory to Sales this Spring, where my personal attendance was necessary, it was impossible to answer sooner, and will be extremely sorrow if my delay has retarded your operations of planting for a single moment, which is of such infinite importance and value; and from the increasing prosperity of the British nation, rise in demand, prices holds out such cheering prospects to landed proprietors. You will easily perceive that in less than forty years, the crop on the ground will be of more value than the land it occupies, and pay a fair rent for the land after the first ten years. I will be most ready to supply you with any farther information from time to time on the subject. I am,

Sir,

Your most obedient Servant,

R. M.

19*th. April,* 1825.

Stirling, N. B.

To John F. Burke, Esq. Greenwich, Kent.

A REPLY to a request made two years after the Survey had been taken, when the Farms were to be sold.

Sir,—Having only this day had it in my power to lay my hands on the Notes of my Survey, &c. of the Woods and Wood-lands of the Farms of Mackroy, and East and West Irons, the property of John M'Farlane, Esq. on Lochfine Side, Argyleshire. I find there is of enclosed and unenclosed Wood-lands, chiefly covered with Oak and Birch, 200 acres; (I beg to say by the way, that with great propriety and advantage more could be added.) The Wood-lands on these Farms are equal, both as to soil and situation, to the very best in Scotland, and will be as productive of Wood and Bark at twenty years old, as many Natural Woods will be at twenty-five years. Supposing these 200 acres converted wholly into Oak Coppice, (for which purpose it only requires the blanks to be filled up with Oak, and the trash extirpated,) and divided into twenty hags or cuttings, making ten acres to cut annually. At twenty years old, the Coppice Wood and Bark, even allowing Bark to keep its present low price, will yield at least L.50 per acre, say L.500 annually; and suppose forty reserve or maiden trees to be reared up on each acre to the age of two cuttings, keeping always a regular succession of forty on each acre amongst the Coppice; these will be worth at least L.2 per tree, which at every second cutting will be worth L.80 more per acre; but to reduce the whole to an average, it will produce L.90 per acre annually, which will be L.900 Sterling of yearly income in succession, without any expense of planting, excepting one person as Forester, say at L.40 yearly; while the Bark, &c. from the thinnings will nearly pay his wages. If you take the locality of these Farms into consideration, where the whole of the yearly produce of these Barks can be disposed of to the fishermen at a fourth more price than to tanners; it will bring in a very considerable sum more than the above. If you consult the Reports of the produce of the Duke of Montrose's Coppice

Woods, and many others, you will see there I am rather, and that too considerably, under than above the annual produce; besides, the Duke of Montrose and others pay, from many places of their Woods, twenty-five shillings per ton, to take the Barks to a shipping place; whereas the Barks from the above Farms can be shipped for two shillings per ton.* As the soil of these Farms will carry timber trees to maturity, and from its beautiful situation it could be rendered particularly conspicuous and interesting as a gentleman's family residence, were a few acres of the wood-lands laid off for a cottage and garden, and standing ornamental trees reared about it; this would infinitely beautify and immensely add to its value, even 50 per cent. more than the intrinsic value of the cottage and trees, by making it so interesting in the eyes of thousands of strangers passing and repassing this estate by Steam Navigation; also, a very few small clusters of ever-green trees planted on the high knowls would greatly ornament it.

The intrinsic value of the crop on the ground at present, with the exception of the reserve trees, may be considered as not great; but when considered as Stools of trees already on the ground that will stand cutting and grow for ages, and as inseperably attached to the ground in so far as the Oak Stools go, may be, and that very reasonably, estimated at L.20 per acre.

I am,

Sir,

Your most obedient Servant,

R. M.

Stirling, 6th. January, 1827.

To A. M'Kinnon, Esq. Writer, Greenock, Factor.

* Locality to water carriage is of the greatest consequence in rearing woods.

On the means of ascertaining the comparative tanning powers of all kinds of barks.

DUBLIN, October, 1824.

MY highly and justly esteemed friend, MR. PARNELL, of Sackville Street, Dublin, who it is well-known is indefatigable in every thing good and praiseworthy, stands in need of no comment from my pen, sent me the following Treatise on ascertaining the degree of astringency or tanning strength in all kinds of bark, which cannot fail to be of very great importance to dealers in that article, particularly to tanners; as by this means they can in a few hours ascertain the different degrees of strength in all kinds of bark, of course come at once at its real value; a thing hitherto unknown but by the long and tedious process of tanning:—

"Of all the manufactures which depend on chemistry for explanation and improvement, that of Leather, though highly favoured by the attention of scientific men, is still, perhaps, most in need of their aid.

Notwithstanding Seguin's happy discovery of the chemical affinity between tan and gelatine, which promised to introduce something like analytic certainty into his art, the practical tanner is yet unable to estimate the goodness of any bark (previous to its actual use,) otherwise than by its external characters. He depends wholly on the colour, taste, and the healthy brittleness which in many cases requires an experienced eye to distinguish it from the brittleness produced by decay. By the mere appearance he may indeed discriminate between sound and unsound bark of the same species; but when both are fresh and healthy, or of different kinds, (for instance, valonia and cork tree bark,) his eye and tongue no longer assist him in determining the proportioned worth of either.

Any method therefore which would enable the tanner to as-

certain with speed and certainty the comparative value of astringents, (of which the market always affords a striking variety) by the examination of samples, previous to purchase, would be a great step towards rendering his business safe, consistent, and regularly profitable;* and would, no doubt, be the means of introducing general improvements into every branch of the manufacture.

To arrive at this is the object of the present essay.

* * * * * * * * *

[Here follow some pages of discussion on modes of valuation formerly proposed, of more interest to the scientific chemist, than the manufacturer. We go at once to the matter of *mercantile* importance.] * * * *

In endeavouring to strike out an unexceptionable process for the use of tanners, and complete this test in the spirit of utility in which Sir H. Davy had first conceived it, I found it necessary to take a different path from that pursued by Proust and Tromsdorff, who endeavoured by the action of reagents to deprive tan of the various matters naturally combined with it, and which essentially modify its action in every case hitherto brought under our notice. Now, the test required ought to resemble in its action, that which takes place in a tanner's pit; for if the mode of trial adopted differ materially in principle from the manufacturing process which it is framed to aid, any estimate of the value of astringents founded on it will be seriously in error. For instance, a tanner's profit chiefly depends on the increase of weight which a hide acquires during the process that converts it into leather. This in strong (sole) leather is generally one-third of the dry weight; or, what tanners are more accustomed to calculate on in Ireland, the finished leather, is half the weight of the hide when fresh from the slaughter-

* A friend assures me, that valonia (which is now much in demand amongst tanners at L.28 a ton) was offered to them from Italy, thirty years ago, in any quantity, at L.4 a ton, but in vain; they then had no means of ascertaining its value experimentally.

house. The extractive matter forms an important part of this weight, and therefore, any test which the manufacturer might apply to ascertain the tanning power of an astringent material, and which acted only on pure tan, would completely mislead him. I am inclined to think that any gallic acid present is also absorbed by the skin. In spent ouze the power of striking black precipitates with solutions of iron is lost, and transferred to the leather, particularly that made with oak bark. In short, the tanner wants something which, when presented to an astringent infusion, will seize on, and enable him to estimate *every thing which would* (in his process on the large scale) *contribute to the weight of his leather.*

I know nothing which can do this so well as the skin itself, and I find that by a little management it may be made to yield us the information we require, quicker than has hitherto been thought possible.

It cannot be doubted that a strong bull hide will continue to absorb tanning matter for two years, if the process be so arranged; but if we alter the usual proportion of the materials, the result, as to time, will differ exceedingly. If a fresh skin be shaven down to a very thin substance on a currier's beam, or split into fine leaves by a machine, so as to expose a great expanse of surface, and a quantity of these be steeped in a proportionably small measure of tanner's ouze, they will, in a very few hours, imbibe all its useful tanning substance, and enable him to ascertain, by the difference of weight before and after steeping, the exact quantity of matter in solution, that can be made available in the manufacture of leather.*

This is a test which comes home to the business of every

* The strongest ouze in a Dublin tan-yard prepared in the usual cold method, was exhausted of taste and colour by this mode in seven hours; a decoction of valonia, (the strongest I was able to make,) of sp. gr. 1066, was, with the aid of frequent manipulation, to change the ouze in the pores of the skin, deprived of all the astringency in about nine hours.

tanner; one which he can place confidence in, because he can clearly understand it; and though some niceties are requisite in this process also, the line of thought necessary to attain them is already so familiar to him, that I have great hopes it is calculated to become generally useful.

There can be no question of the correctness of the principle of this plan, it being that in daily operation in every tannery, yet the field is open for improvement, and the exercise of ingenuity in the conduct of it; but having placed the subject within the grasp of the manufacturer, I candidly confess his superior right to prescribe the details in every thing connected with his handicraft operations.

As however, I have made several experiments to ascertain the proper mode of proceeding, and acquired some experience in the matter, I willingly communicate it, and devote the remainder of this paper to hints which I hope may be of service to the Tanner in going through the test on his own account.

As the object is to constitute a comparison between two or more astringents, and decide quickly on their respective merits, whilst the articles are yet at market a few pieces should be selected from each lot, so as fairly to represent every parcel. The whole of each sample should be separately ground to powder in a small coffee or pepper mill, and passed successively through the same seive, to place each in similar circumstances. From these average samples, the operator may take equal weights, and obtain complete infusions of each, by agitating them with successive portions of warm water till all the soluble matter is extracted.

Though boiling water will hasten the operation, it certainly tends to decompose the astringent liquor afterward, and induces it to depost a portion of insoluble matter which may interfere with correct results. Water at blood heat (98° Fahr.) may be safely applied; bottles to infuse and shake the powders

in, and a piece of muslin to strain through, serve these purposes completely. Care must, of course, be taken to preserve and return any powdered bark which may remain in the strainer, with the next quantity of warm water. Successive additions in this manner are exceedingly more powerful solvents than the whole quantity applied at once. Their efficacy increases in a geometrical progression.

When the several infusions yielded by one sample are united, the average liquor will in general be found sufficiently weak to be acted on by skin with the greatest effect; that is, to afford all the colouring matter along with the tan—an advantage the tanner is prevented from obtaining in strong decoctions of bark. If his experience should lead him to think a particular infusion too strong (which may occur in the examination of astringent extracts similar to kino, rhatany, and catechu,) he may add water to reduce it to what he would call a "safe tanning strength." Aliquot parts of these infusions (one-sixth of each, for instance) are now to be separately submitted to the action of the test skins (to be described afterwards) which should be carefully handled in the liquors now and then for seven or eight hours, to expose new surfaces to the action of the ouze, till the tanner ascertain, by eye and tongue, that the liquors are absolutely spent.

There are a number of critical appearances in various operations, altogether undescribable, and of which inanimate tests give us no warning, and keep no record: In such cases it fortunately happens that the organs of sense give perfect satisfaction to an experienced operator. In the process under consideration, habit renders their decision all-sufficient.

The skins intended for the trial should previously be well washed in tepid water to extract any lime which they may have absorbed in the process of depilation, together with all the loose gelatine which can be squeezed out of the pores along with it;

so that nothing shall remain but the firm fibre, which will bear handling in the usual manner in weak ouze. They are, after this washing, to be dried in the shade, but not near a fire; then cut up into small pieces to fit the miniature tan-pits, and weighed in lots corresponding with the infusions; each lot containing bulk sufficient to fill up the quantity of ouze, and (like a sponge) present an absorbent surface on every side.

This dry skin, as every tanner knows, is in a very unfit state to absorb astringent matter, and become leather. It is, therefore, previous to immersion in the ouze, to be worked with the hands for about five minutes in water just blood-warm (98° Fahr.), and induced by this treatment to soften and swell to its former dimensions, in which state it will be capable of fully exerting its absorbent powers; and if care be taken to give the ouze an over dose of it, the action will be completed in a few hours.

As each ouze is exhausted, its lot of skins should be taken up, dried in the shade as before, and the increase of weight in each lot separately ascertained. This additional weight can consist only of the useful tanning matter, so that the increase of each lot will directly show the true comparative value of the astringent in whose infusion it was steeped.

The skin most proper for this purpose is the strongest and freshest that can be procured, shaved down or split to the thinest substance it can be safely reduced to. The large fresh currier's shavings from the strong hides intended for chaises or harness, can be obtained in quantity, and are well adapted to the process. The skins of ill-fed sheep and cattle that come to market hide-bound from the mountain districts, as well as those of aged cattle in general, are also strong and fibrous enough for the purpose; but what I would prefer to all other (from the description I have received) are ox hides split very thin and evenly by the patent machine.

In Birmingham, (I am informed,) this branch of the leather manufacture is well understood. In Dublin, we have but one splitting machine, and that is only constructed for splitting sheep skins. These, from the improvement that has taken place in our breed of sheep, are generally so full of fat, that they are quite unfit to act as a test in this case, the oil shielding the skin from the action of the tan, and where it exists in the greatest quantity, along the back and across the neck, retarding the evaporation of moistre during the two drying processes, and consequently leading to false results.

Calf skins, shaven down to the thinness of split sheep skins, are free enough from oil, but the fibre is in general so delicate, that it is liable to be injured, and partially dissolved, or rather dispersed through the warm water during the softening and swelling, preparatory to steeping in the astringent infusion. I found that several lots of this skin, previously dried and weighed for experiment, though beautifully transparent, and apparently perfect in every way, lost seven per cent. of loose gelatine when handled in tepid water. Thus this species of skin also appears improper for the purpose.

To avoid the last mentioned source of error, it will be prudent to reserve a piece out of every batch which undergoes the swelling process, to ascertain (by drying and weighing without tanning,) whether the remaining pieces destined for experiment had lost any thing in that operation. As such a loss is only likely to occur in strong hides, from carelessness, in the usual operations of lining, washing, &c. the tanner has it completely in his power, by proper attention, to prepare his own test skins in the most perfect manner. Perhaps the calf skins that I operated on had been somewhat injured in these processes: Whereas, if they had been carefully treated, they might have remained strong enough. This is a point which peculiarly rests with the tanner to ascertain correctly, as a matter of economy and

convenience. If calf skins be really strong enough to retain all their substance from one weighing to the other, tanners who manufacture upper-leather will be much more at home in trials made with them. In Ireland, I believe, there is quite as much of it made as of sole leather.

In the shaving of strong hides, it is indifferent to the currier in what shape he takes off the pieces. A tanner who attends him during that operation, may obtain shavings of the exact size he wants, and therefore, need never sacrifice an entire hide to the experiment.*

I need scarcely mention that the test skins employed in this trial should not be expected to become perfect leather, so as to enable the tanner to judge of the quality of the astringent also. That is an operation requiring length of time, and excess of tanning materials, both of which are here inadmissible.

In the course of experiments which led me to the adoption of the plan recommended in this essay, I have accumulated a number of comparative analyses of the several astringents used in the arts, made with a view to ascertain how the tests would work in all cases, as an index to their tanning properties.

These I intended to annex to the present paper, but satisfied of the correct action of the test, I omit them for the present, convinced that each individual lot of astringent substance brought to market may differ so widely in composition and quality from every other, that such a table as I might be able to form from the examination of particular samples, (not now at market) would only tend to mislead.

My chief hope is, that by the preceding sketch of a process, I

* In a short time, the preparation and sale of these test skins will probably become a regular branch of trade, in connexion with the manufacture of parchment, &c. Tanners may then, without trouble or loss of time, obtain for a few pence the means of regulating the purchases of their stock of bark for the year. Those extensively in trade, who necessarily invest thousands of pounds in this extensive material, will need no further explanation to enable them to appreciate justly the value of this information.

have been sufficiently explicit to enable a tanner to proceed for himself towards the attainment of that important object—a knowledge of the comparative value of all the astringent materials which appear at market, in time to regulate his purchase of any."

(GRATIS CIRCULAR.)

YOUNG PLANTATIONS.

[The following Circular was sent to a number of Noblemen and other landed proprietors in 1826, a year of unprecedented drought, which will be long remembered, and may not be altogether uninteresting, should the like again happen.]

My Lords and Gentlemen,—In this year of unprecedented drought, I am well aware that your young plantations must be suffering very severely, more especially what has been planted this season, and that in particular on dry rocky soils, this I am the more convinced of, not only from what I have seen personally on different estates, and in various parts of the country; but also from the numerous applications, being nearly 200, already come to hand, from different Noblemen and Gentlemen in England, Scotland, and Ireland, inquiring advice as to what course they should take, as much as possible, to recover and save their plantations, some of which being of very great extent, and which appear at present to be a total failure, and must occasion an immense expense in plants and in replanting.

Being well aware, that many who have not as yet applied to me for advice, whose plantations may be in a similar situation, I thought of printing this Circular, containing the following hints, and sending it to those Noblemen and Gentlemen who have honoured me with their employment; and should these hints be the means (of which I have no doubt from former experience) of saving all or any part of their young plantations, I will feel myself most amply rewarded:—

Oaks, &c.—Where the plants of Oak, Spanish Chesnut, Elm, (Scotch or English,) Ash, Plane, Sycamore, Horse Chesnut, Birch, and Alder, (and in some parts of England and in the most of Ireland, the Beech) have failed in the top, and are by no means likely to recover; cut them over close by the ground, trampling and firming the roots well in the earth before cutting off the top, and be sure to cut the plant close to the surface of the ground when trampled down; let this be done in all plantations where there is no risk of the young shoots (numbers of which will yet come away during autumn) being destroyed by game, such as deer, hares, rabbits, &c. in this month, and particularly before the end of September; where there is a risk of the young growths being destroyed during the winter by game, let all such be cut over in the months of December and January; thus by having their roots firmed in the earth, the roots will be growing every day of vegetable weather during winter, and will, in the spring, send out most vigorous growths; there being no risk of the roots losing the growth by the top of the plant shaking with the winter winds. The same method should be attended to with all plants, even two, three, or five years planted, if dead in the top; and not to depend on their side shoots, although fresh, as they never make a proper tree;—*vide* my Forester's Guide, 1824.

Firs.—From the strong gales of wind we have had in most parts of the country, within these three weeks past, I have found great numbers of the Firs, particularly those in exposed situations, very much loosened in the roots, which has been more the means of killing many of them than the drought, admitting the air to the roots, destroying the moisture, although the soil is good and deep, which kills the roots; if the following is attended to immediately,—going through and carefully firming them at the roots, many of them may yet be saved; not a moment should be lost in attending to this; where top shoots of the Spruce and Silver Firs are dead, and the under

shoots healthy, the top shoots should be cut off. I have found this always, where they had sap in the roots, to save the life of the plant or tree when the side roots are healthy; this will be found to answer the purpose completely, where the Firs are intended chiefly for nurses; but when they are intended to be reared as ornamental trees, this sometimes causes them to grow horizontal or crooked.

Layering Natural Oak Woods.—To those Noblemen and Gentlemen in the Highlands of Scotland, who have extensive tracts of Natural Oak Wood, I beg to say, that I was aware, before hearing from many of you, that the layering from the young Oak shoots would be a complete failure this season. To those of you who have been going on with the plan of layering, and who have planted hundreds of acres in this way, and are convinced of the utility of the method, having seen stronger and better growths in two years from the layers, than in five or six years from the plants, I need say little, as what you have lost this season, you will gain next; nor will you be wanting in growths through the autumn, now when the season is set in moist; as a proof this, you need only look back to former years. To those who have only tried the system of layering for the first time this season, I beg to say, you must not despair, as it has been proved, to a demonstration, to succeed; where you have depth of soil, you will have growths yet in autumn, but particularly in spring; but I observe, what you say, that where the soil is very bare, and particularly where you have laid the layer over rocks, the branch or layer seems in many cases to lie dead; nothing else than this could be expected in a season like this, not having a drop of rain or moisture since layered in, and no depth of soil to make the fibres stretch for roots; this will be particularly the case where the incision in the layer has been much cut through, as by this means the sap or nourishment from the old stools is completly cut off,

which should have supplied it till the fibres in the layer became roots, which is not, nor can it be expected till the layers have had a whole year's growth. In this case, a spadeful of fresh earth should immediately, say during this month if possible, be laid on them, and the pins well firmed in; the laying a little fresh earth on them, I mean only in all bare rocky places, will preserve them and keep them moist till next season; taking care not to disengage the layer from the old stool; and although they may receive but little sap from the old stool, yet they will, if an ordinary moist season, receive as much as make the roots stick and form themselves; by attending to this, you will have, in many instances, growths this autumn, but particularly next spring; although they may not have sent out a green blade this season, there is not the slighest room to despair.*

Again to those who have only tried the method of layering for the first time this season, their failure, (together with the disapprobation of such a plan by almost the whole of the respectable body of Nurserymen, whose interest is in a different mode of procedure,) I grant is particularly discouraging; yet the utility of layering and cutting over, by many year's experience, has been proved to demonstration, and is perfectly incontrovertible, as can be attested by thousands. By attending to the foregoing method, I am perfectly assured it will save the expense of replanting.

I beg to observe, before taking my leave of you, that this season I have observed, both in different places of Scotland and Ireland, many trees in plantations of twenty and thirty years old, which had previously been most vigorous in their growth,

* Since the above was circulated, I had occasion so late as November, to be on the estate of Duntroon, in Argyleshire, the property of Niel Malcolm, Esq. where his Forester, James Gow, had layered down not fewer than 50,000 Oak and Spanish Chesnut, early in spring, in one plantation, from natural shoots, &c. and not five layers out of the hundred on an average, had misgiven; a great many of them had made fine shoots of from two to three feet, and were very healthy. The Spanish Chesnuts were particularly promising notwithstanding the drought.

completely dead in the tops; although the buds came out, they never bladed; but these are chiefly in plantations where the ground is over-burdened for want of timely thinning; these, however, will recover next season; but still it would be well, in all such cases, to thin a little, as want of timely thinning often stints the growth of the whole plantation, particularly in such a season as this, and when the ground is over-burdened they will never recover.

I have the honour to remain,

My Lords and Gentlemen,

Your most obedient and very faithful Servant,

R. M.

Edinburgh, 14th. August, 1826.

WINNOWING MACHINE.

[A pattern of the Machine, with the following Letter was sent to the first meeting of the Highland Society at Glasgow, and I have no doubt but its great utility will be duly appreciated in wet harvests, particularly in the Western Islands, and its place here not ungratifing to many of my readers.]

To the Noblemen and Gentlemen, Members of the Committee of the Highland Society, to meet at Glasgow, 27th. Sep. 1826.

My Lords and Gentlemen,—It is a well-known fact, that, in the Highlands of Scotland, particularly Argyleshire and the Islands, it is almost impossible to get in the little crop (chiefly Oats and Bear,) which is of great consequence to the farmer; and oftentimes a good crop; yet from the wetness of the climate, it cannot be got gathered in, in a wholesome state either for man or beast; and oftentimes a great expense is incurred in removing it to high land, and in turning it over to dry, &c. It is well-known that His Grace the Duke of Argyle, erected barns at an expense of L.10,000 in the neighbourhood of Inverary, for the purpose of winnowing the crop. It is with a view to

decaying, covered over with a piece of lead, or otherwise, they would send out most vigorous shoots, gain a new top as a Pollard, become as beautiful as ever in a few years, and stand so for generations while their trunks are preserved; this may be seen by the fine, fresh, and healthy shoots they are at present sending out notwithstanding the decaying and decayed state of their bowls No plan could more efficiently have been taken to destroy and hasten to decay these trees than the method in which they have been pruned, by cutting the large branches at a distance from the trunk of the tree, and allowing them to rot off, which never fails to leave a hole to admit of water, &c. and which ultimately rots the whole tree. All these branches and places should be most carefully and properly dressed up, smoothed into the bowl of the tree; and if there is already a hole or symptom of decay, it should be covered over as aforesaid; and if the place is sound when dressed up, it should be covered over with coal-tar paint, or a balsam prepared for the purpose of preserving the wet from getting in, or the sun from opening the pores of the timber to admit the wet. Is not Shakespeare's fine lines very appropriate to those trees—

"Their boughs are moss'd with age,
And high tops bald with dry antiquity."

No. II.

Clump opposite the approach Gate.

This clump of old trees, however small in size, from its elevated situation has a most beautiful appearance to a stranger, when walking or driving up the avenue just before described. The whole of the trees should be kept up with the greatest care; not a single tree should be cut out of it; and should any of them die in the top, by being whipped by its neighbouring tree, it should be immediately cut over and pollarded; a few ever-

green shrubs could be put in amongst their roots with propriety and advantage; four trees of Spruce and Silver Firs, say two of each, could be put into the blank ground, on the south side, and reared up to maturity, to stand in a triangular form, looking down the avenue. On the right, in entering the gate, there is a fine Beech tree, most miserably pruned, and that too very lately; the branches should be immediately cut close into the tree, as formerly directed, otherwise it will very soon kill the tree. Nothing can be more ruinous and destructive than a system of prunning of this kind. In approaching the gate on the left, are two Larch Firs, which are destroying the Evergreen Laurels, nor will they ever be ornamental trees. They should be immediately taken out, before they do any more harm. The young Spruce Firs towards the fence should be cultivated with care; rear as many of them up as will stand in a triangular form to cover the view of the field. The young Larch Firs should be taken out. Prune properly, dress, and cover up the wounds in the fine old trees here, in order to preserve them as long as possible from decay.

No. III.

Left side the approach Gate to the Mansion, within the Gate.

At the back of the gate-house or lodge, take away the Ash that is whipping, destroying, and overtopping a fine ornamental Beech, as the Beech will be by far the most ornamental and long-lived tree, it should get scope, and the Ash never will be a proper tree, from the manner it has been abused in the prunning. Farther on the left is a clump of fine old trees, many of which have also been abused in the prunning. As these trees not only afford shelter to the adjoining fields, &c. but are also beautifying and ornamental to the place—not a single tree should

be cut out of them. When any of the hard wood trees die in the top, it should be immediately cut over as a pollard. The whole of the hard wood trees that is abused in the prunning should be examined carefully, and all the spoiled places and blemishes dressed properly up and covered over, so as not to admit of water into the bowls of the tree. Several fine pollard trees of Beech are to be seen here, which proves to a demonstration, that by pollarding such trees as I refer to, will be a means of preserving them as ornamental trees for ages, after it may be supposed they were lost for ever; and in this and all such places, to preserve a tree for ornament is of the very greatest importance. A little farther on, left side, close to the approach road, is a fine healthy Ash, with one of the top branches broke, and lying over on a fine Beech, which has been allowed to do so for, it appears, at least a whole season, which is not only destroying the Ash but also the Beech it lies on; and if not remedied, will in time be the means of killing both trees, which of course would make a dreadful blank:—this is a degree of carelessness that deserves to be severely reprimanded. The branch should be cut off the Ash, and the place where it is broke at present, dressed up, as also the branch it has destroyed on the Beech, and that immediately. On the north side of the approach road—as the whole of the trees here, as well as those described, and the whole leading on both sides to the mansion, giving an infinite dignity and ancient grandeur to the place, altogether indiscribable, so that the greatest possible care, and every thing that human art or ingenuity can devise, should be applied to preserve as long as possible their growth and appearances as trees; not a single tree should be cut, nor so much as a healthy branch should ever be cut off any of them. When a single branch is broken off any of them by the wind or otherwise, the place where it is broke should be immediately dressed up, and covered over as aforesaid; when any of them

die in the top, it should be cut over, and pollarded; even when they die in the roots, they should be allowed to stand as long as there would be a green blade from them, and till other trees, if possible, be reared in their place.

No. IV.

Beech-Grove.

FROM the gate on both sides of the approach, close in to the mansion, there are a number of very fine tall magnificent trees, and for the most part they are very healthy; still there is also manifest the greatest want of care and attention in not dressing up the wounds and broken branches on them, in order as long as possible to preserve the health and growth of these fine trees; which, from the situation they occupy, when a single tree is taken away, it makes a dreadful blank, and such as may reasonably be supposed will take at least three lifetimes to replace. I grant, that had these trees, as also the others I have just been describing, been thinned in time, say when they first arrived at a height of sixteen, or not exceeding twenty feet, they, by geting scope to branch out, would have been much larger, more ornamental, and more beautiful trees. I would here beg leave as I go along, to observe once for all, that whenever a plantation is intended for standing ornamental timber trees, they should be thinned out regularly and gradually, first at the height of six, or not exceeding eight to nine feet; at the height of twelve, or not exceeding sixteen feet; (say eight or ten years after) to eighteen feet, tree from tree, at the height of from twenty to twenty-four feet, to thirty-six feet, tree from tree, or as near as can be, at which, if in a very exposed situation, they may stand as a finished grove or lawn of timber trees, taking special care always to leave the best and most healthy long-

cality of my present subject, as it only regards a few noble individuals, and their private property, it would, I fear, be deemed improper to be more public; time alone, and those who embark in it, will prove the justness of the remark. Let it be carefully noticed and always kept in view, that in going over in the way of a survey, of Woods and Plantations, it is impossible I could condescend upon the particular number of trees, where it is necessary to suggest the propriety of a thinning, that should be taken out; but from the hints given, and the methods laid down to be followed up, any person, of but ordinary skill and judgment in forestry, will be at no loss to discover all such.

Let it be carefully observed, that in making out Reports of Surveys of Woods, Plantations, and Wood-lands, particularly when such Reports are printed, or made up into a small volume, they are always bound up with blank paper at the end of the Report of every Farm, Wood, or distinct Plantation, which is intended for the proprietor noting down instructions for the forester or operating manager; and for the forester, on his part, noting down and keeping a regular account of the expense or time consumed in making these improvements. Also the money received for the thinnings or sales of the various Plantations or Woods distinctly; which, if properly attended to, cannot fail of being highly satisfactory both to the proprietor, forester, and all concerned; each keeping a distinct book and comparing them occasionally; this is particularly the case when the proprietor does not always reside on the estate.

green shrubs could be put in amongst their roots with propriety and advantage; four trees of Spruce and Silver Firs, say two of each, could be put into the blank ground, on the south side, and reared up to maturity, to stand in a triangular form, looking down the avenue. On the right, in entering the gate, there is a fine Beech tree, most miserably pruned, and that too very lately; the branches should be immediately cut close into the tree, as formerly directed, otherwise it will very soon kill the tree. Nothing can be more ruinous and destructive than a system of prunning of this kind. In approaching the gate on the left, are two Larch Firs, which are destroying the Evergreen Laurels, nor will they ever be ornamental trees. They should be immediately taken out, before they do any more harm. The young Spruce Firs towards the fence should be cultivated with care; rear as many of them up as will stand in a triangular form to cover the view of the field. The young Larch Firs should be taken out. Prune properly, dress, and cover up the wounds in the fine old trees here, in order to preserve them as long as possible from decay.

No. III.

Left side the approach Gate to the Mansion, within the Gate.

At the back of the gate-house or lodge, take away the Ash that is whipping, destroying, and overtopping a fine ornamental Beech, as the Beech will be by far the most ornamental and long-lived tree, it should get scope, and the Ash never will be a proper tree, from the manner it has been abused in the prunning. Farther on the left is a clump of fine old trees, many of which have also been abused in the prunning. As these trees not only afford shelter to the adjoining fields, &c. but are also beautifying and ornamental to the place—not a single tree should

be cut out of them. When any of the hard wood trees die in the top, it should be immediately cut over as a pollard. The whole of the hard wood trees that is abused in the prunning should be examined carefully, and all the spoiled places and blemishes dressed properly up and covered over, so as not to admit of water into the bowls of the tree. Several fine pollard trees of Beech are to be seen here, which proves to a demonstration, that by pollarding such trees as I refer to, will be a means of preserving them as ornamental trees for ages, after it may be supposed they were lost for ever; and in this and all such places, to preserve a tree for ornament is of the very greatest importance. A little farther on, left side, close to the approach road, is a fine healthy Ash, with one of the top branches broke, and lying over on a fine Beech, which has been allowed to do so for, it appears, at least a whole season, which is not only destroying the Ash but also the Beech it lies on; and if not remedied, will in time be the means of killing both trees, which of course would make a dreadful blank:—this is a degree of carelessness that deserves to be severely reprimanded. The branch should be cut off the Ash, and the place where it is broke at present, dressed up, as also the branch it has destroyed on the Beech, and that immediately. On the north side of the approach road—as the whole of the trees here, as well as those described, and the whole leading on both sides to the mansion, giving an infinite dignity and ancient grandeur to the place, altogether indiscribable, so that the greatest possible care, and every thing that human art or ingenuity can devise, should be applied to preserve as long as possible their growth and appearances as trees; not a single tree should be cut, nor so much as a healthy branch should ever be cut off any of them. When a single branch is broken off any of them by the wind or otherwise, the place where it is broke should be immediately dressed up, and covered over as aforesaid; when any of them

die in the top, it should be cut over, and pollarded; even when they die in the roots, they should be allowed to stand as long as there would be a green blade from them, and till other trees, if possible, be reared in their place.

No. IV.

Beech-Grove.

From the gate on both sides of the approach, close in to the mansion, there are a number of very fine tall magnificent trees, and for the most part they are very healthy; still there is also manifest the greatest want of care and attention in not dressing up the wounds and broken branches on them, in order as long as possible to preserve the health and growth of these fine trees; which, from the situation they occupy, when a single tree is taken away, it makes a dreadful blank, and such as may reasonably be supposed will take at least three lifetimes to replace. I grant, that had these trees, as also the others I have just been describing, been thinned in time, say when they first arrived at a height of sixteen, or not exceeding twenty feet, they, by geting scope to branch out, would have been much larger, more ornamental, and more beautiful trees. I would here beg leave as I go along, to observe once for all, that whenever a plantation is intended for standing ornamental timber trees, they should be thinned out regularly and gradually, first at the height of six, or not exceeding eight to nine feet; at the height of twelve, or not exceeding sixteen feet; (say eight or ten years after) to eighteen feet, tree from tree, at the height of from twenty to twenty-four feet, to thirty-six feet, tree from tree, or as near as can be, at which, if in a very exposed situation, they may stand as a finished grove or lawn of timber trees, taking special care always to leave the best and most healthy long-

lived trees; if underwood is necessary, keep the ground always full with underwood from the cuttings. But to return from the height,—these trees having arrived at the length of time they have stood in such an exposed situation, it would be impossible to cut away a single tree without injury to its neighbouring tree, either by stinting it in its growth, for a number of years, exposing it to be blown down by the storm, or altogether killing it; therefore a single tree cannot be taken out here with safety, nor with any degree of propriety. It may be here argued, and that too in truth, and with a degree of propriety, and so to speak common sense, and every one the least skilled in rearing plantations of timber trees, will at once admit, what I have been saying is both impossible and absurd; for instance, they will tell me what is very true, that many of these trees stand so close together, that they are evidently killing each other, and if allowed to stand many more years together, both trees will not only be injured, but actually killed; then there will be nothing but a blank, no tree at all; there are a number of blanks already, and perhaps from this very one cause, it is certainly much better to take away one tree and save the other, than allow both to be lost; it may be said they have stood long together, and may stand much longer, but the longer the worse —you say take away one tree, it will kill the other,—the very one it was taken away to preserve, you say may be blown down by wind, and make a blank; this may happen, the world may soon come to an end, and there will be an end of the trees also; this I grant is all fair and rational; we are here treading on sacred ground, and the person that would cut away a single tree here, which has required centuries to rear, at the risk of a supposed improvement, would be committing a crime. There is however a plan and method left of preserving and keeping a crop on the ground, of these grandest of nature's productions, even in their exposed situation and neglected state,

and I beg permission to say, that the managers of all estates would do well to deliberate seriously before cutting old full-grown trees in this and all similar places. The plan to be followed up in preserving these trees, in this and similar places where the one tree is evidently destroying its neighbouring tree, or destroying each other, so as both will shortly die if not remedied, is to cut over one of the trees for a Pollard; in so doing the greatest attention and skill is requisite, taking care to cut it as high up as it possibly can be done, to clear and relieve the other tree, leaving always all the healthy branches on the outside of the Pollard; and rather than cut the main trunk of the tree not to be Pollard, take a branch or two off the side of it that is injuring the tree to remain; suppose another case, when two trees are very close together, and one of them could be spared altogether, should one of them be taken away all at once, the top of the tree left will be, for a wonder, completely bare of branches on the one side, say the side pressed on by the other tree, and will have a miserable appearance as a tree, and it is ten to one, if ever it will have a proper look as an ornamental tree; to remedy this, and to have in a few years a beautiful tree, cut as a Pollard, the most healthy and best of the two trees, say the one intended to stand as the most ornamental tree, keeping as aforesaid, the trunk of it as high as possible, and all the healthy branches, &c. on it below where the trunk is cut, allowing the other tree to stand so as not only to shelter it till it sends out its new branches, and forms its top, but also to keep the space full with the look of a tree till such time as the Pollard has formed its tops properly, when the other tree may be taken away; and no deficiency of a tree will be perceivable, as the Pollard will soon cover much more ground than they did both together, and be a much more beautiful tree than one standing with only a half top, say the top all on one side; by attending to this, a crop of fine trees will, for ages, be kept on

the ground. Where there are already blanks in this and the aforesaid plantations, these should be filled up with plants of Oak, Spanish Chesnut, English Elm, Plane and Lime Trees; when these are put in, enclose them singly with my portable paling, *(See Forester's Guide,)* which is both elegant, durable, and cheap. I have been the more particular with the trees here, as they hold a most distinguished part and situation on the demesne, and require immediate attention, and should I meet with any other trees or clusters of planting requiring the same treatment, I will only give a reference to this. It is agreed at all hands, that nothing beautifies or makes a nobleman's mansion look more antique than to have fine large old venerable trees, and the greatest imaginable attention should be paid to the preserving and keeping up all such trees. The making of Pollard trees in places of this kind is of great use when large trees are transplanted; the best method I have always found in doing it is, to Pollard the trees to be transplanted two or three years before transplanting them, so as they may be forming a top.

No. V.

—— *Walk.*

Here are to be seen a number of very fine venerable old English Elms, which are, in so far as I have seen, a very great rarity in this country. Indeed such magnificent and sublimely grand trees are seldom to be met with any where. Here I am extremely sorry to have again to lament the little, poor, deplorable regard paid to these noblest of nature's productions. In order to hasten the decay, and to consign to oblivion the fine row of these trees along the garden wall, in front of the mansion, which perhaps cost some of their ancient proprietors many a waking night, and who knows but petitions were put up

to the Eternal—he who clothes nature in her perfection of beauty, to protect and bring these trees to the degree of perfection in which they now appear, yet some fratricide has in a most cruel and wanton manner cut the roots off the whole of these trees, from one end to the other, to the depth of two feet and upwards, and that too within three or four feet of the trunk of the trees, which, in plain language, is to say, get thee gone thou dandled darlings of nature's children, which have been dandled on the lap of nature for centuries, and let a garden cabbage or shrub take your place—which, like Jonah's gourd, is reared in a night or season, and dies in a season. Had I the overcharge of these woods, trees, &c. I could hardly ever forgive the servant who dared to put forth his hand or his breath to say, "away with them, away with them;" his situation would hardly atone for such a crime—it is well I know not the man, or his name as aforesaid would swell the pages of history.—Were trees, like any other crop, sown in spring and cut down in full maturity in autumn, this or something like it might have passed over, but the hand that plants can never see them reaped in maturity, therefore I say, once for all, that trees planted for shelter and ornament should never be cut down, particularly when arrived at such a degree of perfection, without consultation and due deliberation. Even the proprietor himself may have to regret, when too late, the cutting or taking down of such trees, particularly in such a situation, where they give so much beauty and antiquity to such a grand mansion. The beautiful lines of the poet, so apropo, plead an excuse for using them:—

"The Elms are fill'd and adieu to the shade,
And the whispering sound of the cool colonade,
The winds play no longer and sing in their leaves,
Nor the Ouse on its surface their image receives.
—Years had elaps'd since I last took a view
Of my favourite field and the place where they grew,

When behold on their sides in the grass they were laid,
And I sat on the trees under which I had stray'd;
The black bird has sought out another retreat,
Where the Hazels afford him a screen from the heat.
And the scene where his notes have oft charmed me before,
Shall resound with his south flowing ditty no more.
My fugitive years are all passing away,
And I must myself lie as lowly as they,
With a turf at my breast and a stone at my head,
Ere another such grove rises up in its stead."

There are a few of these trees spoiled in the top; they should immediately be cut over as Pollards, about six feet at least above the garden wall; the trunk, if hollow, covered over to prevent any further decay, and allowed then to Pollard, and the blemished parts carefully dressed up, as directed in No. IV. The undermining and cutting of the roots should be carefully filled with good earth, and never again re-opened. The Pollard Elm at the north-east end of the mansion, is a beautiful specimen of the degree of perfection that a Pollard can be brought to by attention and care. In the management of young plantations it is altogether different, although they have even arrived at the age of fifty, or say sixty years; in this case, when the trees are vigorous in growth, a proper selection should be made, leaving always the more healthy and thriving, and such as are likely to be the longest lived trees. Although those left may happen to have a bad top on one side, spoiled with its neighbouring tree, from its healthy and vigorous growth, it will soon gather and recover; in cases of this kind, they should always be allowed room and scope; by the cutting or destroying of the trees in question, in one unlucky moment, if we compare the future with the past, the work of five or six generations is spoiled. Where is the man, in his thinking moments, knowing the proprietor's absence, that would risk the daring attempt. If there was such a man, generations yet unborn will curse his bones while rotting in the dust. I could give many

names of places, where the proprietor, in an unthinking moment, had cut down old timber trees about pleasure grounds, and afterwards repented to such a degree, that when looking on the awful blank, totally unable to supply its place, although they should give all they had; sad remorse made them forsake the ancient demesne of their forefathers. The old trees on both sides the garden wall, so long as protected from the hands of the assassin, and a green blade flourishes on them, their venerable tops will nod in solemn silence, and proclaim peace to the slumbering ashes of their ancient proprietors, who planted and protected them to such perfection.*

No. VI.

Silver Dale.

This den or ravine, on both sides the run of water, has in many places considerable blanks, which should be filled up, where dry, with Oak, Spanish Chesnut, and, to give variety to its look, Spruce and Silver Firs. At the top of this there are some fine old Ash trees, covered with ivy, which is a great ornament to the place; and to a person standing within a few yards of them, they have a most impressive effect, and calls up to mind the inexorable calm pace with which time has passed over them, marking with his ravages, destruction in every step; their boughs falling to pieces, and trunks tumbling over their hollow base with age; methinks religion raises her supplicating eyes to plead for a release in vain—in vain philosophy, with all her wise maxims, and melody, with her sublime songs —in vain could they combined, touch the cold unfeeling heart of time. Yet methinks the awful tyrant, totally unused to

* The roots of the fine trees referred to, were cut at the suggestion of the Gardener, to stop them from running into the garden. I only learned this lately, and near twelve months after this report was wrote.

spare, relented when he struck their finished pride, and partly to repair the ravages his sweeping hand has made, and to renew in green verdure those brightest gems of nature, ties up their tottering trunks with twisted ivy How indiscribably beautiful are these dead trees in their grave clothes, returning to their original nothing, clothed in their ivy-mantled shroud. If I durst but give scope to my flying imagination for a moment, to an infinitely more grand and sublime subject, and take a peep at the noblest of all God's works falling to pieces in the grave; but the immortal part, clad in the ever-green ivy of a Redeemer's righteousness, woven in the loom of his obedience, and died in his atoning blood, will shine in all the verdure of youthful beauty through eternal ages—but hold, the subject is too sublime for my unworthy pencil, and has rivited me too long to the enchanting spot—farewell! ye perfections of nature's beauties.

Both sides here would make a fine bank for natural Oak coppice; but so near the pleasure grounds, I am of opinion it should be kept full on both sides with ornamental trees. Where the bank is wet, it should be drained and planted up as aforesaid; some places here that could not be altogether drained, from their marshy nature; these may very advantageously be planted up with the tree Willow, say Saugh or Black Poplar, which will grow well in the wet places. Some Alders in this bank, which never will be profitable trees—should be cut out, as also all brush-wood and rubbish before planting up the places referred to.

The trees referred to were very large old trees, from 80 to 120 feet high; all their small branches were fallen off them by decay, and their large broken arms, or rather stumps, streached several feet out from the trunks; covered with green ivy over their highest tops were enchantingly beautiful.

No. VII.

——— *Young Plantation.*

THIS young plantation does not seem to be doing so well as might be expected, and nothing will, I fear, bring it to be a plantation but perseverance, by keeping it always full of plants. There are too many Scotch and Larch Fir trees, none of which answer the soil well; the common Spruce Fir will do better; but the Oak, the Plane, the Beech, and Ash, will be the only trees that will come to maturity as timber trees here. The blanks should be completely filled up with these kinds, and regularly cut over till they are past the danger of dying; the most of the Ash plants should be cut over this season, close by the surface of the ground. This, from its proximity to the last bank described, should be reared as a standing clump of timber trees, and regularly thinned as it comes up, as already laid down in No. IV. plantation. The old wooded bank, looking down on the river, requires a few plants put in—keep up the old trees—the plants to be put in must be enclosed singly, as the expense of enclosing the whole would be too great for the few trees required. Plant with Spanish Chesnut, Ash, and Elm, and enclose them singly with my portable paling, as before recommended As this is a very thin bare soil, all the Oak, Ash, and Plane plants should be large when put in, so as to have strong good roots, and cut the top off them close by the surface so soon as put into the ground, as there is little or no sward growing to injure the plants; the Fir plants should only be two year old seedlings when put in, say not above six or eight inches long.

No. VIII.

——— *Field.*

THE bank here, below the old burying-ground of Churchtown, is much in want of filling up, as it is fit for nothing else

but trees; it should be kept full; plant and enclose singly, Oak, Spanish Chesnut, Plane, and Scotch Elm, to be reared as standing timber trees. The bank to the west is a most excellent bank for growing or rearing trees of every description; and the present trees upon the ground are no crop, comparatively speaking, there being a great many Alders which will never be profitable nor ornamental trees—it would be very easy and no great expense to run a paling along the foot of the bank, and cut away the worthless trees of Alder, &c. and plant and fill up with plants of Ash, Oak, &c. Such of the Ash as will be ornamental trees may be left; a tree or two from the Alders at the Burn Cottage could be taken out with advantage, and improve the others by giving them scope.

LARGE TREES GROWING FROM THE OLD STOOL, CHIEFLY PLANE, ASH, AND ELM.

No. IX.

Craignehall Parks.

The few trees marked to be cut in these fields are only such as are dying or very materially injuring the others; they should be cut down with the greatest care not to injure those that are to stand, particularly those that are to be cut from the old natural root; there being three, four, and sometimes five trees growing from the same root; the tree to be taken away should be cut in a sloping manner, and the cut afterwards carefully dressed up so as not to lodge water about the old stool to injure the trees to stand. It is worthy of observation, that the trees growing from the old stools here, notwithstanding their exposed situation, (being almost opposite the east point of the island of Jura,) are in a most healthy and thriving state, and have attained the size of from four to eight feet in girth; while

those growing from the plant are not near so large nor so healthy. It is plain to a demonstration that the surest, speediest, and most effectual method of rearing timber trees to maturity in exposed, bleak, and bare situations, is from the natural stool or root. In one of these fields stand two common Willows, or Saughs, which are really worthy of notice; these trees are only twenty-five years old, (the man is alive on the estate who planted them,) and now contain 58 cubical feet of timber; these trees, at 2s. per foot, their lowest price is L5. 16s.; which is a very great encrease in 25 years; then an acre of land, even the very poorest, if adapted for Willows, will carry at least 400 of of such trees, which, in 25 years would be worth L.1160 Sterling per acre; but even allowing only 200 trees on an acre, would be L.580 for every 25 years—an annual rent of from L.20 to L.30 per acre; this is not imaginary—these trees are growing in a field near Duntroon Castle, Argyleshire. I have formerly recommended the Saugh, Willow, and Poplar as a most profitable crop in damp or wet soils; in deed nothing can be more profitable in places so adapted for the purpose.

No. X.

Island Mackaskan, the property of Neill Malcolm Esq.

This island is wholly surrounded by the Sea, and betwixt it and the main-land it is navigable for large vessels—exposed to, or rather standing in the Western Ocean, within a few miles of the great gulf of Coryvreckan. It is not my design to give a description of the island, but only to shew what a degree of perfection trees can be brought to, even on the most exposed situations. Here is an island, not only without shelter, but exposed to every wind and blast that blows; so much so, that sometimes in a storm, the Sea spray is known to have been

driven nearly over the whole of it,—still trees will not only grow, but arrive at maturity on this island. I need only call the attention of the reader to the trees at present on it:—There are a great number of Plane trees, and these too on nearly the most exposed part of the island. The girth of one of these trees at the smallest place of the trunk, four feet from the ground, is eight feet two inches; there are a number more nearly the same size; it may be proper to mention, that these have all been reared from the old stools, some of them are beginning to decay, particularly the largest one; but this is only at the root of the trunk, a little above the surface of the ground; nothing but the ravages of time has done this, for its top is as green as ever in summer. The Oak, the Ash, the Scotch Elm, and Plane are growing in great numbers through the island; were it not that it is pastured with sheep and cattle in summer, the whole island would soon be covered with wood self-sown, as the whole wood on the island is natural. A few years ago when I surveyed this island I advised the wealthy proprietor to plant the whole of it, as nothing else could be more advantageous and profitable, whether for natural Oak as coppice, or rearing trees to maturity; from its advantages of sea carriage, it would pay uncommonly well per acre, notwithstanding its rocks, it would soon plant itself if the cattle and sheep were taken away; it needs no enclosing.

No. XI.

A Neglected Coppice Wood.

The Coppice Woods on these Farms, covering an extent of some hundreds of acres, and occupying land not capable either of croping or pasture; yet will grow excellent Oak on almost every foot of them, and if properly attended to, divided into hags, say twenty-four cuttings, cutting a lot yearly, could be

brought to pay at the rate of L.7 10s. Sterling of annual rent every acre; it is at present in a most shamful state of neglect. The ground in almost every part of it is covered with stools or stems of Oak, at not more than three feet stool from stool, and these not having been thinned since last cutting, are completely overburdened, and are evidently killing each other and dying for want of nourishment, so that the whole is stinted in their growth, and having been allowed to stand from ten (the youngest cutting) to sixteen years old; it is plain to the most superficial observer, that if not thinned out immediately, one fourth of the crop will be totally lost, and the whole rendered unproductive, and to say the least of it, not near half a crop. All Coppice Woods should be thinned the first year after being cut over; *(See Forester's Guide on neglected Coppice,)* besides, it may not be unworthy of notice, that, by allowing a Coppic Wood to remain in that state, it loses both in quantity and quality of bark, as also in usefulness of timber, and incurs more expense in manufacturing; for instance, the bark of the whole is thinner,—becomes hide bound on the tree, and requires more bating to take it off, of course there is less natural sap, so that it weighs lighter,—is not so good in quality, and being sapless or hide bound, requires more time and expense to it take off; and besides, none of the shoots, from their stinted state, have arrived at the size of spoke timber, and is only fit for charcoal or fire wood. It is both natural to suppose, and a truth that cannot be denied, that when a healthy tree or stool of Oak is cut over, it sends out a great or profusion of shoots, and even these in a very luxuriant state,—sends up more sap than the young shoots are able to absorb, and for the first two or three years we often see the sap running off the top of the stool, or root, to waste. Now, if the saplings or young shoots are thinned out the first year after being cut, to three or not exceeding four upon the stool, these receiving all the

sap after the first year, from the thinning, become so healthy and strong, that they absorb all the sap the roots send up; and we have often seen growths of Oak, Spanish Chesnut, Ash, and Plane in three years, twelve and fifteen feet high, and six inches in girth at the roots; it is therefore always advisable and most profitable to dress up the old stools properly, and rear the saplings therefrom, if fresh and wholesome, then to shift the shoot to be reared up to one of the fibres of the old roots. If there is vacant ground on any of the sides of the stool, the superabundant sap may be saved to great advantage, by laying bare some of the leading roots nearest it with an axe, and it will send up a shoot or two which will fill new ground; this should be particularly attended to in all Coppice Woods; * but here we are treading in a Coppice of from ten to sixteen years old,—and will thinning at this age do it good, either as to quality or quantity? I say it will. For example, I requested a proprietor of Oak Coppice Woods in Stirlingshire, for leave to try an experiment on two neglected acres of Oak Coppice, at the age of fifteen years. The Wood contained about thirty acres, which had been all cut in one year; with the consent of the proprietor and assistance of his Land Steward and Forester, we selected and measured off two acres as near a-kin to each other as it was possible, and so similar in growth, &c. that not the least difference was perceivable betwixt them; a halfpenny being tossed up which was to be the acre thinned out; one of the acres was immediately thinned, leaving three, four, and not exceeding five shoots on any one stool; the thinings were barked, although it was of course, (as should always be done,) the unthrifty and dying shoots were taken away, still there was from the thinnings one ton two hundred weight of bark, which brought only about L.11·; the bark was not the best in quality. The two acres were allowed to grow in

* See Plate 2nd. Figures 3rd. and 5th.

this state for nine years, till the age of twenty-four years from cutting time; and it is a notorious fact, that the acre thinned out produced near a fourth part more bark than the acre not thinned, and the bark too of better quality, and the timber of the thinned acre brought near double the value of the other, as many of the shoots were fit for cot-house purposes, and not a few for spokes. This shews at once the propriety and advantage of thinning Coppice Woods, even although neglected to a considerable age. But it is the greatest loss and folly imaginable to allow natural woods to come to this age before being thinned, as the growth of the whole is injured, and of course less productive; but when such has been allowed to stand too long; still by giving them a thinning, they will be found both profitable for the present crop, and advantageous for the growths in future, by having fresh healthy roots when cut over, to rear the new growths from.

No. XII.

Rearing up unenclosed Natural Stools.

It is as notorious a fact as the sun at noon day, that throughout most of the Counties comprising the Highlands of Scotland, particularly the whole of Argyleshire, that there are millions of stools or roots of Oak and some other kinds of trees detached throughout almost the whole of the extensive fields now appropriated to sheep pasture; nor is this to be wondered at, when we consider that many thousands of acres of land that was formerly carrying Natural Woods have of late years been left unenclosed and set aside for pasture lands; it is no less wonderful than true, that, the growths of these stools or roots, though devoured and eaten up in winter by cattle and sheep, are never wholly extirpated; as soon as the grass gets up so as to afford a supply of meat for the sheep, &c. the growth gets up, and so soon as the grass fails, the growths or saplings

are eaten up. Now, were these dressed up from the old root or stool and enclosed singly, many a beautiful and truly valuable timber tree could be reared; as these stools send out most rapid growths, the enclosing would only be required for two, three, or not exceeding four years, when their tops would be totally out of the reach of cattle or sheep. It is a fact that sheep are always detrimental to trees; but when once the natural growths of Oaks, &c. are out of their reach in the tops or lower twigs, there is no danger of their not becoming timber trees; the method of enclosing all detached stools of this kind could be most effectually done by my portable paling, *(See Forester's Guide,)* as the stobs and bolts could be easily carried from one stool to another as they are required; or wherever their are Larch Firs, four or six stobs of Larch, and these twisted up with the small loppings of the Larch will be found to stand as long, from the first puting up, as will be necessary, and this will cost a mere trifle. For example,—there is on two or three farms in North Napdale, Argyleshire, the property of Neill Malcolm Esq. of Poltalloch, (taken from actual survey,) 40,000 unenclosed Oak, and 20,000 Ash Stools; the whole not worth at present L.300 Sterling, nor will they ever be worth much in their present unprotected state; were these thinned out for standing timber trees in such a manner as described in my Forester's Guide,—say take away all the radical or unthrifty shoots, and leave on them one, two, or not exceeding three of the very best, healthiest and most thriving, and those most likely to become trees, such as were pointed out, or particularly described to the Forester as we went on; and on such of the stools as have comparatively no shoots from them, having been eaten up by the sheep, &c.; dress such properly up for the growth before enclosing them, and a very few years after being enclosed, will put them completely out of the reach of cattle, &c. If this is properly attended to in the way and manner shewn the Forester,

as I went along, in twenty years after, these very stools will be worth at least L.50,000 Sterling; in from fifty to sixty years, worth L.150,000 Sterling, timber and bark; observe, as the old stools or roots are large, there will be three trees, on an average, reared up to maturity as timber trees from every stool; besides, these trees will still be increasing in size for two centuries to come, notwithstanding their ornament and increase in value, as timber trees. Let every unprejudiced person, the least acquainted with that country, anticipate the infinite grandeur and beauty such trees will add to the whole country, and to the prosperity of the proprietor of these farms; nor do they take one inch of ground from the farms, as by clearing away the rubbish and confining the stools into two or three shoots from them, there will be the more grass. I suppose on these farms there are not four trees to an acre, so that in a few years the trees will be worth much more than the proprietor paid for all the lands. It may be worthy of observation here, that the whole of these trees could be gained by about an outlay of L.50 for men thinning, dressing, and enclosing. I may also observe, that the wealthy proprietor has an immense number more on his extensive properties in that country, and has set about these and other improvements with spirit and life. I beg to add, that a great quantity of excellent timber trees could in this way be here reared up for the British Navy.—None that ever travelled from the head of Glenshirea to the farthest part of Kintyre, or from Inverary to Campbellton, without going one inch off his road, but must have seen thousands of such stools, and if such a quantity of timber can be reared, and a vast sum of money realized from a few stools, thereby yeilding so great a profit to one individual; what would be gained to numbers by attending to it on the same extent, and this is but a small portion to what I could mention, and all this, I had almost said, within a rope's length of where vessels could take the timber of them on board?

I have often been surprised at the supineness of many of the proprietors in this part of the country, especially those who, almost a nod from them, so to speak, could rear up such properties to themselves and their posterity,—ornamental to their estates, and embelishments to the whole country, I may also add, pardon the expression, such saviours to the sea girt Islands of Britain; and my surprise is the more, having had the honour to be on many of their lands; and above all things, with my tongue and my pen, impressed on them this easy and profitable improvement. I hope and trust this volume will help to awaken them from the strange lethargy in which they have been enveloped for so long a time. The wealthy proprietor whose farms have just been mentioned, has an extent of land little short of forty miles, from Eriaden Lochaw, to Castle Sween, and were that gentleman to offer me a choice of the Woods on the wood-lands, or the rental of these farms for seventy-two years, with liberty to take in the unenclosed stools of wood on these farms, I would take the Woods, and by this means I would insure to my posterity, at the end of seventy-two years, a sum of at least L.500,000 Sterling from timber trees on these lands; and have annually a good living from the three Coppice cuttings; nor would this take one acre of land off these farms, nor one shilling of the present rental. But this gentleman has already begun to appreciate the value of improving his Woods, by establishing such a system and puting the operative management of that system into the hands of a Forester, whose skill, propensity and indefatigable activity in planting and rearing Woods and Plantations, will, in a very few years, be an immense revenue to his posterity.

No. XIII.

The following from the pen of the late Lord Meadowbank, n his interesting and judicious instructions to Foresters, which

coincides so much with what I published in the Forester's Guide, on the necessity of rearing underwood in belts, and the injurious plan of prunning Firs, will not be uninteresting to my readers, and no doubt it, also some other extracts from it would have appeared in that work, had it happened to fall into my hands before I published it; but I regret that I only saw it a short time ago:—

His Lordship says, "At first one is astonished that in the cultivation of parks, or of additions to parks of the most considerable proprietors, and of persons whose rank and consequence, lead to expect that they have the best information of the damage which threaten sometimes to be irreparable, is often inflicted in the rearing of the young timber. The park of Duddingstone, near Edinburgh, has belts of Oak and other trees which should rise to the first magnitude, from the breadth of the belts, the warmth of the climate, and the great depth and richness of the soil; but these belts have seemingly, with great care, been keept cleaned, not only of all underwood, but the lateral branches of the trunks have been cut off, and the winds in summer and winter pass through them without impediment in all directions. Hence trees that, if tolerably treated, ought to have risen to the height of from 80 to 120 feet, and should have already 60 to 70 feet, will, in all probability, never attain to half the size that they should have attained. Had the lateral branches been left for a time with due subordination in size and position upon the trunks, the sap would have been invited by their loving principles, to ascend to the summits of the trees,—their temperature would have been preserved as warm as the climate admitted of, and the sward below being also darkened by underwood, originating seeds sown by the birds, would have become lank and harmless to the growth of the trees; and in this way too they would have acquired the outline and aspect of natural woods, and by a judicious prunning of their tops,

would have grown speedily and freely in their youth; while in their age they attained the greatest dimensions that the soil and climate in which they were planted admitted. It is quite remarkable, how in consequence of an abundant supply of underwood along the north belt of Lord Morton's Park, at Dalmahoy, from Burnwynd, eastward to Addiston, the trees that suit the soil are evidently already secure of attaining the first magnitude, though planted only about the same time with Duddingstone belts, and certainly not favoured by superior advantages of soil or climate. One would still however cherish a hope, that in consequence of the natural longevity of the Oak, and the proportional duration of healthful roots and youthful vigour that belong to it; underwood, and especially ever-greens, such as Silver Firs, Hollies, and Lauro-cerasus might still be successfully employed to renew the vigour of such plantations; care being always taken to remove trees of inferior sorts when they appear to encroach upon the Oaks and discourage their growth. But unfortunately such mistakes are not confined to Duddingstone, where the absence of the noble proprietor may account for the maltreatment of the Park; for one often sees similar mistakes elsewhere committed, and underwood and lateral branches carefully cleared away from plantations, and even from belts, under the notion that it robs the trees of the larger proportion of nourishment they would otherwise receive. Nothing however is more certain, than that the underwood favours the growth of forests.

In a way not more excusable one sees in travelling to Melrose by Middleton and Bankhouse, the lateral branches of Scotch Firs, still in extreme youth, carefully amputated, and even Larches, which so indispensibly require the balancing power of their branches, though rearing in sheltered situations, treated mercilessly in the same manner, and deciduous trees too; a few branches at the top being alone saved, except now

and then some trifling twigs on the sides of the Beech or Oak, which seem to have been deemed too insignificant to obtain notice.

It is perfectly obvious to any person in the slightest degree acquainted with the cultivation of trees, depriving Larch and Scotch Firs of their lateral branches, the roots that formerly nourished them, comparatively useless. These no longer transmit the same abundance of sap upwards to be prepared by the lateral branches; and of course, being comparatively useless, the roots become proportionably inert, and the stem acquires little or no additional volume except from the action of the uppermost tiers in preparing the sap, which however will no doubt in time, though slowly, contribute to give it somewhat of a columnar instead of a pyramidical form.

But let it be considered what miserable dwarfs such trees must become, even with all the advantage that the lofty sloping banks of that district, and masses of the plantations there may continue to afford. The trees will no doubt be less agitated than in exposed situations; but they are deprived mainly of the principal means afforded by nature for preparing their sap and increasing their elevation and volume. The top and lateral branches form the great instrument for this object; the tip of every branch seems to attract the sap to it upwards, in proportion to its tendency to elevation, though it may be preternaturally favoured for a little by the crowding of the trees, cannot ultimately proceed with that certainty, uniformity, and advantage of general growth, which confining on the plant its due proportions of breadth and stomach, would enable it to reach. In fact, the proceeding here censured seems to be as absurd as to attempt raising abundant crops of potatoes by depriving the plants of their branches, save the central stems; or feeding an ox by means of taking measures for diminishing the capacity of his stomach, or the membranes of his lungs, when

the juices furnished by the stomach are exposed under due precautions to the action of the different grasses, under the excitement of a particular temperature."

I have been in company with some English proprietors of Woods who argued, that Scotch Firs will not thrive and grow to any size, nor become good timber; this however shews that all such have never seen the Highlands of Scotland. There is on the hill of Dunequach, and on some of the hills of Glenshera, and Glenaira, Scotch Firs of the greatest magnitude, and exposed to the storm from all quarters, growing many hundreds of feet above the level of the sea; many of these trees have from 40 to 60 feet of a trunk, and contain 100 solid feet of timber, equal to the best Memel timber; there are also fine large Scotch Firs in many places of Inverness and Ross-shires, on high exposed situations.

There is on the estate of Tollymore Park, Ireland, the beautiful seat of Earl Roden, according to a valuation made in 1826, nearly L.100,000 worth of growing wood, and with the exception of a very few trees, the whole do not exceed sixty year's growth; while the ground these trees occupy could hardly be turned, with advantage, to any other purpose; many of the Larch Firs on that estate have been cut away as thinnings to improve those to remain, and have brought L.5 and upwards; several clusters of these Firs contain upwards of 1,000 trees on an acre, and at an average value, will sell for L.3 per tree; some Silver Firs planted at the same time, now contain 140 solid feet, and worth L.10 per tree; many of these trees grow in a very elevated and exposed situation.

The noble proprietor is still going on enclosing and planting, and has, within these two years, most judiciously planted upwards of 300 acres of the waste lands on his estate. The profits his Lordship is deriving from his plantations, though

only cutting for improvement, hold out the most cheering prospects, and should bestir other proprietors to go and do likewise.

It is astonishing that proprietors should be so backward to their own interests, by not taking greater care of the plantations already on their estates, and planting more of their waste lands, when to a certainty they hold out such inducements to profit. So attentive were our ancestors to insure a proper supply of timber, that the proprietors of woods were compelled by the statute of the 31st. of Henry the VIII. to leave twelve of the best standrils on every acre of Coppice, at each fall; together with a due proportion of younger branches for succession ; and were at the same time restricted from cutting any of the former, till they should measure forty inches in circumference, at five feet from the ground.

In many parts in the Highlands of Scotland, and particularly in Ireland, woods suffer much by the hands of the pilferer, particularly so in all places where coals are high in price, and other kinds of fuel scarce; in many places great mischief is done by wantoness to young plantations; and wherever this is the case, it really should be punished to the utmost. The following Acts of Parliament, so far back as 1685, which may not be generally known, well deserves a place here, as it shows very strongly the regard our ancesters had for the protecting and rearing of Woods, &c.:—

Copy of Acts of Parliament regarding the destroying of Trees.

Act of Parliament, 1685, Cap. 39, it is *inter alia* statuted and ordained, "That no person shall cut, break or pull up any Tree, or peel the bark off any Tree, under the penalty of Ten Pound Scots, (16s. 8d.) for each Tree within ten years old, and Twenty Pounds Scots, (L.1 13s. 4d.) for every Tree above that

age. The havers and users of the timber of any Tree so cut, broken, or pulled up, are declared liable to the same penalty, unless they can produce the person from whom they got it. And if the person convicted be not able to pay the fine, he is discerned to work a day for each half mark contained in the fine, to the Heritor whose plantation has been cut down or broken."

The same Act ordains, "That no persons break down or fill up any Ditch, Hedge, or Dyke, by which ground is enclosed, or leap, or suffer their Horse, Colt or Sheep, to go over any Ditch, Hedge, or Dyke, under the penalty of Ten Pounds Scots, *toties quoties*, whereof half to the Heritor, and the other half for mending and repairing Bridges and Highways within the Parish, at the sight of the Sheriff, Steward, or Justice of the Peace, before whom the Contraveners shall be pursued."

The Act 1698, Cap. 16, ordains, "That Tenants and Cottars, (Cottagers) preserve growing Wood and Planting upon the ground they possess; and that none of it be cut, broken, or pulled up by the roots, or the bark peeled, under the pain of L.10 Scots, for each tree under ten years old, and L.20 Scots, for each Tree above that age, to be exacted by the Masters allenarly."

By Statute 1st. Geo. I. sess. 2, c. 18, it is enacted, "That if any one shall mischievously break down, cut up, bark, destroy, or spoil any timber Tree, fruit Tree, or other Tree, the person damaged shall receive satisfaction and recompence from the Inhabitants of the Parish, Town, Hamlet, Villa, or Place, to be recovered by way of summary action for damages, as in other cases of riots; unless the party offending shall be convicted by such Parish, &c. within six months. Upon complaint made by the Parish, Hamlet, Villa, or Place, or by the Owner of the Trees, or by any other, to two or more Justices of the Peace, the offender is, when convicted, to suffer imprisonment, and whipping, and is not to be discharged till he find securities for

his good behaviour for two years." And by the same Act, "If any person maliciously set on fire, burn, or cause to be burned, any wood, underwood, or Coppice, he is to suffer as a willful fire-riser."

No. XIV.

Great Chesnut Tree on Mount Etna.

[A friend having sent me a drawing of the Great Spanish Chesnut Tree upon Mount Etna, with a description of it, which I here subjoin as a treat to every lover of trees, and the more readily, as in the sequel it will be seen, that I not unfrequently recommend the propagation of the Spanish Chesnut, both as a profitable and ornamantal tree.]

THE Spanish or Sweet Chesnut always grow to an immense size in every country. The largest in the known world are those which grow upon Mount Etna, in Sicily. "This celebrated tree exceeds the size of other trees so much, that it cannot fail to excite the greatest admiration. It has its name from the following circumstance:—Jean of Arragon spent some time in Sicily on her way from Spain to Naples. While here, she visited Mount Etna, attended by her principal nobility, and happening to be overtaken by a storm, they took shelter under this tree, whose branches were sufficiently extensive to cover them all.

A celebrated traveller reports this tree to be one hundred and sixty feet in circumference, but quite hollow within, which however affects not its verdure; for the Chesnut tree, like the Willow, depends upon its bark for subsistance, and by age loses its external part. As the cavity of this enormous mass is very considerable, the people have built a house in it, where they have an oven for drying nuts, almonds, chesnuts, &c. of which they make conserves. They frequently supply themselves with wood from the tree which encircles their house, so

that it seems likely in a short time to go to ruin through the ingratitude and thoughtlessness of its inhabitants. Besides this, there are abundance of other trees of the same species in the neighbourhood very remarkable for their size, all very beautiful and straight, and almost as smooth as polished marble; one of them measured thirty-eight feet in circumference, and there were numbers of others nearly of the same size. Among these there were seven standing together, which have received the name of the seven brethren; another is denominated the ship from the general figure of its top, which has some slight resemblance to a ship. Its diameter is twenty-five feet, so that the circumference cannot be less than seventy-five feet."

That the Spanish Chesnut will thrive well in all parts of this country there is no doubt, if properly cultivated. There was standing a few years ago at Fortworth, in Gloucestershire, a Chesnut tree fifty-two feet round, and it is proved to have stood there ever since the year 1150, and was then so remarkable, that it was called the Great Chesnut of Fortworth. It fixes the boundary of the manor, and is probably one thousand years old.

There are seventeen trees of Spanish Chesnut in the lawn called Wintertown, near the Castle of Inverary, the seat of His Grace the Duke of Argyle. The average solid feet in each tree 155; some of them girths upwards of 20 feet a little above the ground. In the Old Garden Wood, near the Castle, are forty-five trees averaging nearly 100 feet each; these trees, before some of them began to fall into decay, were worth upwards of L.2,000 Sterling; many of them are tall magnificent trees, nothing can excel them in beauty. The Chesnut, as an ornamental tree, is excelled by none and equalled by few, and it has a degree of greatness belonging to it, which strongly recommends it to the Forester's attention; its properties as timber have been pointed out and recommended elsewhere in this book.

I may here add, that its timber is universally allowed to be excellent for liquor casks, not being liable to shrink, nor to change the colour of the liquor it contains. Its fruit too is valuable, not only for swine and deer, but as human food; bread is said to have been made of it and found very wholesome; upon the whole, the Spanish Chesnut, whether in the light of ornament or use, is most undoubtedly an object of great admiration.

There is a Chesnut on the estate of Gask, Perthshire, which girths twelve feet in the trunk, the branches of which spread to a great extent, covering no less than three hundred feet in circumference, of course a most magnificent tree.

No. XV.

Cnochgamgoach; or, Alexander M'Donald's Camp.

[Stroneskar, on the estate of Neill Malcolm, Esq. of Poltalloch, near Lochaw, Argyleshire.]

THE beautiful old Scotch Firs on this artificial knoll are of an excellent quality, and are still healthy and thriving, although assailed by boistrous winds, unprotected and unsheltered in all directions; all possible care should be taken of these venerable trees to preserve them from external injury; as from their detached and elevated situation, they are a great ornament to the whole of this part of the country, and it is probable, were growing on this fairy knoll when this part of Scotland was overrun and plundered by the Irish warrior, Alexander M'Donald, commonly called Sandy M'Donald, about two centuries ago, when they would be mute witnesses of his rueful countenance when informed of the name of this knoll; his nurse, who was possessed of the gift of prophecy, or prying into futurity, told him that all his adventures would prosper with him till he stood on Cnochgamgoach, when the scales would be turned against

him, and in all his future adventures he would be worsted, which, as history informs us, turned out to be the case. There are other old trees on this farm, which, in this part of the country are a great beauty; these venerable productions of nature speak more than volumes, to what a degree of maturity and perfection these noble works of nature can be brought in this part of the country; nothing but the ravages of time, that great leveller, and I may add, the lapse of two centuries, has brought some of those stately trees to show symptoms of decay; a person must be filled with delight and wonder on seeing trees unprotected and uncared for, towring to the clouds in magnificent grandeur and bidding defiance to the storms and tempests which has, during these two hundred years past, shaken to their foundations the strongest castles built by human art and ingenuity, and laid many of them in ruins;* when clad in their summer, robes, they look down on all the boasted pride of man, and verify, that "Solomon in all his glory was not arrayed like one of those." He must be void of feeling and hard hearted indeed, that would not be sorry to see these noble productions of nature that has bide defiance to the ravages of centuries, yet returning totheir original nothing, especially when he calls up a single reflection on his own momentary existence.

No. XVI.

Explanation of the Plates.

Plate I.—The Great Chesnut Tree on Mount Etna. See No. XIV. page 68.

Plate II. Fig. 1.—This is intended to represent a Pollard Tree, which is an excellent method of thinning out groves of

* It is well-known there are a great many old castles, once very strong places of defence and safety in this part of the country, now in ruins.

See page 66

Engraved for Monteaths Miscellaneous Reports of Woods & Plantations &c &c.

old full grown timber trees, where ornament and screen is absolutely necessary to be kept up. See No. IV. p. 40, 41. It may be only necessary here to remark, that this is also an excellent method when trees of a large size are to be transplanted into exposed situations, to Pollard them one or two years before removing them, and allowing the scions to make some progress in growth after the top has been amputated, in the same manner as preparing the roots in transplanting old trees. *(See Forester's Guide.)* It may be also necessary to remark, that if the trunk of the tree is solid where cut over, after being cut it should always be dressed up to a point in the centre to make the wet run freely off it, and also to prevent any dust or rubbish from lying on or getting in betwixt the bark and the trunk so as to injure it; this should be carefully attended to when healthy trees are Pollarded. When it is old decaying trees. See No. V. p. 44.

Plate II. Fig 2.—This is intended for a representation of the converting of natural growths or stools into standing timber trees; see this method also fully explained in *Forester's Guide.* Beautiful growths of this description are to be seen in many places; but it must have struck every person with delight on passing those on the public road near Stirling, to Dumbarton, and betwixt Thornhill and Drumfries. See the propriety and profits of this method, No. XII. p. 55, 56.

Plate II. Fig. 3.—Represents a Coppice Stool having been properly cut and thinned out in time; the shoots to the left shows them occupying new ground, from roots laid open, rearing from the old stool. See No. XI. p. 52.

Fig. 4.—Represents a tree cut high above the surface of the ground, so that the shoots or wavers never come to be of any value either as to wood or bark, and are always loose and apt to be broken off by snow or otherwise.

Fig. 5.—Represents something of the same kind, which meth-

od of cutting should always be guarded against, as it is never productive. See this fully explained in *Forester's Guide.*

Plate II. Fig. 6.—This is a representation of a tree growing by way of miracle, from an old Stool, never having been enclosed or cared for; yet had grown up both to be useful timber and beautiful; but see the contrast betwixt this and Fig. 2. which had been enclosed, in point of value. See No. XII. p. *55, 56.*

No. XVII.

It will be seen in Plantation, No. XLV. (Deer Park,) that I recommend having roads or rides through woods, as no small acquisition, and this is particularly the case when in the neighbourhood of a mansion, being equally a refuge from the heat in summer and the cold of winter. Where these are in dens, &c. where there are rivulets of water, with bridges crossing for the private walks of a family, where there is only heard the humming of birds and sounding of the rivult, it must be enchantingly beautiful. Besides, such roads make the woods of easy access for the proprietor, and brings him acquainted with what his woods contain. To persons of opulence, who are proud of such property, roads of this description tastefully laid out must be particularly gratifying; all such roads should curve so far, that the wind cannot traverse any great length through them; an additional advantage which such roads and bridges afford, where necessary; namely, facility to the transporting of the timber, bark, &c.

In all places requiring bridges, I beg to call the attention of my readers to those made of iron, either for foot walks or carriage ways, being cheap, durable, and ornamental. The most modern, cheapest, strongest, and best made iron ones I have seen, are those erected by Mr. John Justice of Dundee; a short de-

scription of them may not be uninteresting to many of my readers, and of some importance to such as may be intending to erect any similar. The suspension bridges, designed and executed by Mr. Justice, differ from others, owing to the ingenious way they are constructed; in my opinion, more strength is also produced from less iron than in any that I previously knew of. I have recently seen one erected by him in 1823, for Colonel Chalmers, at Glenericht, the country seat of that gentleman. The span of which is 104 feet, the road 10 feet wide, with a carriage way in the middle, and a narrow foot path on each side. This bridge is capable of bearing any weight that can be put on it; indeed the first trial was seven loaded carts, each drawn by one horse, so as they could be all on it together.

This bridge is supported by two strong chains under the road-way, each of them proved, before putting up, to carry a strain of 25 tons; but the principal strength lies in twenty-eight suspension rods, each of them was also proved, before being put up, to carry 20 tons; so that the strength is superior in a ten fold degree to any weight that can go on it.

Notwithstanding the great strength produced, owing to the way it is constructed, there are only 2 tons of fine iron in the supension rods, bottom chains, back stays, and every thing else in any way suspending or bearing the strain of that ponderous weight; and about 3 tons more of commou English Iron, applied, in main posts, at the ends, (to save mason work,) and the cross beams or joists for supporting the road-way, and other parts where tenacity is not required.

All parts of this bridge contribute jointly to the general strength, as well as severally to that of their respective places; and any part, except the main posts, may be taken away at pleasure without weakening the general structure, more than the mere use of that part taken away; which must be of great use in case of repairs being required in the lapse of time, and I believe the

expense was not one-third of what a stone Bridge would have cost, although plenty of stone is to be found on the spot.

Besides bridges for carriages, Mr. Justice has erected a number of foot bridges, some of which are upwards of 60 feet span, and which did not cost more than L.40, including mason work; and these not only carry as many people as can go on them at once, but as many horses. Bridges of same span, for carriages will cost L.80 more, independent of mason work. These bridges are adapted to every situation, but some situations will cost much less than others.

I may also observe, that in wooded dens and ravines, where there is rock on both sides, which is often the case, these bridges could be erected at an expense of little more than twenty shillings for mason work, and put up by any ordinary mechanic, as they are all put together and proven at the factory.

No. XVIII.

———'s *Wood.*

This long bank of wood is really in a miserable state of neglect. There are, for about three or four perches—length, from the east end ascending the bank, where there are some very good trees, chiefly Ash, but on proceeding above that, there is little else but trash or natural stools of Alders, a few Ash and Beech, and particularly, a little before arriving at the bridge that crosses the river and onwards to the top, there are hardly any thing but trash of that kind. Here we come into a very marshy place for a good way, which should and could be very easily drained, by cutting open drains through it. As this is a most excellent bank for a natural Oak wood, which is both very profitable and ornamental in a place of this kind, while it in its present state it will not pay, or even come to be useful to the estate in any sense, if allowed to remain in its present state;

indeed, it is still getting worse by the trash killing what might have come to be a good trees; besides, it is just so much lost land to the property. The method to be followed here, and to recover this almost lost place, is to go carefully over the whole, beginning at the east end, marking all the healthy and thriving trees of Oak, Ash, and Elm, or other hard wood trees that there is any hope of rearing to maturity as timber trees; and here I would also recommend a selection to be made from amongst the natural stools of Ash, &c. although these may not come to maturity as timber trees, yet they may stand a few years, to keep up the look of it as a wood, till others come up; marking all such trees with paint, and then cut over the whole of the others, clearing the bank of brushwood, &c. and plant the whole ground with Oak, at eight feet, plant from plant, convert the whole into a natural bank of Oak Coppice, which will not only be the most profitable, but also most ornamental when turned into this purpose, and will pay an annual rental of at least L.7 10s. per acre for ages to come, and that without any expense whatever of keeping it up—it is already well enclosed. Keeping always the thrifty trees of old timber standing, or maidens, as they are generally termed, amongst the Coppice, which will keep up its look as a plantation of standing timber trees; the Coppice will not only be beautiful, always healthy and thriving, but will also afford excellent shelter for game, say pheasants, &c. and being so near the mansion, is also a consideration of consequence. This should be set about immediately with spirit. The Alder, &c. and other wood to be taken out, will do much more than pay the expense; the Alder and other small wood will bring in a great deal of money, in cutting up into barrel staves.—Let it be understood, that by cutting up the staves, a great deal more money will be realized from the cuttings than otherwise. There is a small clump of Spruce and other Firs at the top of this bank, below ———'s

cottage, very thriving, which shows to a demonstration what fine wood could be reared here. The row of old trees along the top should all be reserved till the Coppice, &c. come up. A circular saw, to go by water or otherwise, could be put on a threshing machine for about twelve pounds, which would be extremely useful for cutting up the staves, as also fire-wood for the house use, and will do it at the sixth part of the expense of common labour

No. XIX.

——————— *Field.*

THE row of trees at the top, and otherwise round this field, as also the row of old trees running up the centre of the field, should be allowed to stand, as they are very ornamental when viewed at a distance, from their elevated situation; there are a very few dwarfish trees in the row along the top, that never can get up, which may be taken away with propriety; but these will not exceed five or six in number, as the more that stands the better it looks while they continue green. All trees in single rows round enclosures should be thinned out to proper distances when young, because when allowed to press upon each other till they are old, they for the most part get bad tops, and never are good looking trees; when necessity makes it necessary to take some away, those left have always bad tops on the side where the other tree whipped it, and ten to one if ever it will recover branches to become a proper tree. I grant that trees in single rows having two open sides to extend their branches on, will do closser than those in plantations that are pressed on all sides, still all single rows should be thinned out to proper distances before they be twelve feet in hight, and all the branches left on them to make them as ornamental as possible; trees for this purpose should not stand closser than fifteen feet, tree from tree, even in single rows.

No. XX.

——— *Wood.*

This wood has got a good thinning, and the stools of the Ash being well dressed up, they are for the most part sending out most vigorous and strong shoots from the old stools, and in a few years a great many better trees from the old stools will be got reared, than the old ones left; the wood is now wholly well enclosed. But it is like locking the stable door after the horse is stolen; the sheep and cattle having got in before, have injured a great many of the young growths, they will however come on, being protected. A good many of the dwarfish Ash trees may yet be cut over and allowed to stool, as some of them in their present state never will be trees. This should be done with a good many, indeed with all that are not likely to be proper trees otherwise; where wet, drain, plant up the blanks with Oaks, and fill the whole ground up with underwood, as shelter for game, &c.

No. XXI.

——— *Wood.*

This wood has been skilfully and most effectually drained, which is the life of the standing trees, of the plants already in, as it will be of those to be put in; a few of the scraggy Ash trees and of the Alders, may still be taken out, rear up from their stools, particularly the Ash, which will make much more ornamental and better trees in quality of timber; fill up with plants of Oak, Beech and Elm; rear all the new growths, even of Hazel, &c. for underwood, with which it should be always covered, as it will cover over the drains, and give a much more agreeable look to the surface of the wood. This part of the plantations will very soon show the excellent effects of draining, as in its

present state the trees are all dying, and more than one half of the ground good for nothing, which will then carry fine timber trees, of almost every description. I would say to the forester—go and do likewise to all the other marshy wet places. I have known many old trees, even apparently dead, when the ground was allowed to lie wet, recovered by judicious draining.

No. XXII.

———'s *Glen.*

"Nothing exaggerate, extenuate, or set down aught in malice."

This Bank of old wood on the left, going up, requires filling up, which should be done with plants of Oak, Spanish Chesnut, Plane, and Elm. Where very wet, drain—where damp and cannot be got perfectly drained, plant Willow tree and Poplar, a few Spruce Firs may also be put in the Bank. On the right, going up, is a bank of very fine young trees, chiefly Oak, which, in my opinion is very properly done, it is thriving, and if attended to as it ought, it will soon be a very fine bank of valuable timber trees. Observe the method of thining as laid down in plantation No. IV. There is a fine single row of old trees, chiefly Beech, between Meadow Park and this Glen, which is very ornamental, and should always be kept up to two or not exceeding three Oaks, completely over-topped, near the south end in the hollow, which may be taken away without any injury to the remaining trees, or to their look, nor could they do harm but good, nothing more should ever be taken out of it. There are two very fine Oaks on the new line of road which stand singly, and I was truly sorry to see their roots so cut up, as I think it would be a great pity, besides an injury to the look of the place, particularly in driving up the new road—if they were allowed to fall down, it would be well to lay the earth again, forming a circuit to their roots; cause the

road sweep round them if possible, to keep them alive and standing. Crossing the rivulet of water, above the bridge, the whole ground, which is excellent for rearing planting, is covered with trash of Alder, which should be wholly cut over, the ground drained by open cuts, and planted with Ash, Oak, Elm, Plane, Beech, Spruce, and Silver Firs.

Passing towards the top of this Glen, there is a plantation of fine young trees. Again, I am under the painful necessity of reprimanding the system of prunning which has been practised here, the most ruinous that could be possibly carried on, and it is fully a century and a-half since such a plan has been known, or in existence. Here are to be seen the most healthy and thriving young trees that could be imagined or seen any where; indeed they have been coming up, and most vigorous, perfect models of beauty as trees, till the murdering hand of the prunner has disfigured a great many, I may say almost every one of them, in such a shocking and shameful manner, that such a display of careless ignorance never did before come under my inspection in all the course of my profession. In taking a back look of the part of this Glen we have just now left, we may say that the forester, like the insatiable tyrant death, has surely begun at the wrong end of his work first, by passing over decrepid and worn-out trees, already falling down with old age, and nipping infancy in its bud, and youth in all its blooming and vigorous beauty. Here are to be seen trees stripped naked of all their branches on the one side, and that too from the root to the very top—even the principal top shoots, in a great many cases, are not spared, which has so disfigured a great many fine trees, that they never will be proper ornamental trees. The whole of this plantation should be immediately gone over, and carefully thinned out to the distance of about ten feet, tree from tree, or as near as can be. In the thinning, the greatest skill and caution is necessary,

being particularly careful to spare the Oak, Scotch Elm, Spanish Chesnut, Plane, and Spruce Firs, so as to rear as many of them alternately at the distance as can be saved. In six or eight years after, this whole bank should be again gone over, and thinned out to about twenty feet, or as near as can be, at which distances they may then be reared up to maturity, as a standing bank of ornamental timber trees. Taking care, as aforesaid, to spare always the healthiest and most likely to be the longest lived and most ornamental trees. The whole ground should be kept close covered with underwood, which can be easily done by dressing up for growth, the stools of the Oak, Spanish Chesnut, Elms, Planes, and Ash to be reared from the stools. Where there is a choice, take away the tree that has been most disfigured in prunning. I must observe, that in all places of this kind, where the soil is rich and good for rearing trees, they should never be planted so thick as they have been here; because when allowed to stand too long in such a thick state, they not only injure each other by getting bad tops, but the roots are also injured, as a mortification of the roots oftentimes takes place, and sometimes kills the whole, or stints them in the growth so as to make the whole unthrifty and delicate looking trees. Another injury done by too thick planting in good soil when not thinned out very early is, the ground gets so loose about the roots that they shake with the wind, so as not only to be easily blown down, but the whole trees are deprived of proper nourshisment; such is the case with this plantation, as a person may put his hand to the tree in many places and push it over by the root; hence many of the Spruce Firs although not above the height of twelve feet have been blown down. The trees here have been put in at a distance of only three and four feet when planted. Observe that in planting all such soils, the plants, say the kinds of trees to be reared up to maturity, should always be planted at re-

gular distances, say ten feet, plan from plant, then it is no expense nor difficulty to thin them out regularly; but in much exposed places a nurse tree may be put in betwixt each, which should be early taken away; by attending to this method of planting, it will be very easy to leave it in the power of any one, without much expense or stretch of ingenuity, to raise up plantations to maturity as timber-trees, whether for profit or for ornament. I have been the more particular here, as it is the first plantation of the kind on the Estate that has come under my eye, and should any more simliar plantations occur, I will only give reference to the system here laid down. I may further observe, that the rearing up of young plantations on a Nobleman or Gentleman's property is of far greater importance than many, even proprietors themselves are apt to imagine, and the situation of a Forester on an Estate such as this, is one of the very first and greatest responsibility, and only men of ability, of enterprize, and of genius should be entrused with the management of planting and rearing woods as Foresters. If a Forester has any regard at all for his own character he will duly consider that he is not only working for his present proprietor, and his posterity, but for his king and for his country, always remembering that the sea girt islands of Great Britain are deeply interested in the operation of rearing plantations of timber-trees for navy purposes—what is the office of a Landed Proprietor's Factor or Agent, what is the office of a Land Steward, what is the office of a Gardener, what the office of any servant about a Nobleman's establishment when compared with his? If I durst hazard the remark, I would say the Forester that has extensive tracts of plantation to make and rear, and who does it judiciously, it may be said of him in some future day, laying his employer's interest aside for one moment, that he has done more for the interest of the nation in preparing materials for

her wooden walls, than the bee-headed statesman, who not only keeps the national house to which he belongs in a buz—

> But puts Whigs and Tories in each others ears,
> And make them agree like wasps and bees.

To observe once for all, the Forester, before beginning to thin or prune this or any other plantation, should earnestly pause and hold a consultation not only with his employers, but within his own breast, deliberately asking himself for what future purpose or design is the plantation intended. Is it for Coppice, say solely for profit, or to rear up trees to maturity, that will in the end bring the most money to the state—or is it to rear trees to stand to perfection for generations, as ornamental on the estate, and according to the different propositions fixed on, his conduct in planting, prunning, and thinning should be regulated. Such a system of prunning as is here described, and has been followed in this plantation, is the most ruinous that possibly could be contrived, and should always be guarded against; nothing can be more ruinous both to the growth and look of a tree than to prune it up like a pole; when trees are to be reared, particularly for ornament, the prunning knife should never be applied after they are six feet high.

No. XXIII.

——— *Field.*

The row of old trees in this field should be allowed to stand; not one tree taken out, as it has a very commanding and beautiful look at a distance, as has also the strip at the head of the field, it affords shelter to the adjoining fields, as well as ornamental to the place—being planted and formed at first on too narrow a principle, nothing can with safety or propriety be taken out of it. Strips and belts of planting made of this kind

for shelter and ornament, should never be less than one hundred feet broad, and always attended to in the thinning out as early as possible, say when the trees are at a height of eighteen or twenty feet; they should be thinned out at equal distances of twenty-five feet, tree from tree, or if in very exposed places, to twenty feet, at which they may stand as a finished strip or belt of planting, taking special care to have them standing in a triangular form, facing the wind. Observe, the thinning must be done gradually, from the trees having been six feet high.

No. XXIV.

———'s *Grove.*

In this grove there is a number of fine trees which have arrived at a considerable degree of perfection, notwithstanding their having been altogether neglected in the rearing. Let it be carefully observed and always kept in view, that all plantations, whether in large or small clusters, should be regularly and gradually thinned out. Observe the method laid down in plantation No. IV. - Here the soil is very rich, but the situation much exposed, so that it is altogether impossible to thin a single tree out of it with safety. The same remark will also apply as in No. III. In all places of this kind, when trees are taken out, they should be grubbed out by the roots. Nothing can be more disguisting to strangers, or to the proprietor himself, when walking through his fine lawn, to see the old roots of trees cut so high above the surface, strangers would be ready to draw a hasty conclusion, and say, surely these trees, particularly where a blank is perceivable, have been cut out to make a little money, or for some such necessitous purpose; it would add much to bettering the look of this and some other places in a similar state, were these old roots taken out. The blemishes in the healthy trees should be carefully dressed up as

formerly recommended, and the whole allowed to stand without any cutting, unless where a tree becomes perfectly dead, which should always be taken out before the timber of it be useless. All the blanks should be filled up amongst these trees; this should be done with Oak, Spanish Chesnut, Scotch Fir, Elm, Plane, Spruce, and Silver Firs; these, when put in, must be enclosed singly, to protect them from the cattle. It would be advisable to put these in plentifully, so as a choice of proper trees may be obtained to rear for ornament, as also to supply the place of those dying out or blown down, and to keep a proper crop of fine trees always on the ground.

No. XXV.

Pasture Land.

THERE is a young clump of planting near the head of this field which would be very ornamental, and has been at first well chosen and laid out as such, but it has been allowed of late to fall sadly into decay; the fences are all broke down and sheep admitted; nothing could be more destructive; the fences should be immediately made good, and the blanks filled up with Spruce Firs, Oak, and Spanish Chesnut. The strip of trees running along the head of this park, should always be kept up; wherever there are gaps, plants should be put in, and whenever any of the trees show symptoms of decay or dying, plants should always be put in to supply their places, and reared up as large as possible before the others be taken away. There are a number of very fine old detached trees through this park, as also several clusters, all of which should be preserved and kept up with the greatest care. There are several blanks in the clusters which should be filled up; also a number of single trees could be put in throughout this park, particularly in the high parts of it, with great propriety and advan-

tage to the look of the place, and to protect them, enclose singly, as before recommended. With great advantage, a number of transplanted old pollard trees could be put in, which would greatly improve the look of this field.

No. XXVI.

——— *Meadow.*

In the clusters and rows of trees in this meadow, there has been some of the most unaccountable cutting and thinning that I have ever met with:—For the most part a number of trees, not fewer than six and seven in many places, particularly the north side, have been all cut out of one place, which has made great blanks and gaps in many places. Healthy trees have been cut out very lately, and that not a few, which is spoiling these plantations very much, and in such a wanton manner, as it is totally impossible to account for such conduct. What the hand of the unskilful and merciless thinner has thought worth his while to leave, the ravages of winter have laid hold of; the improper thinning has let in and laid open to the storm many places, so that numbers are now and then blown down, and will be so to the end—plant as in No. XXIV. The roots of the trees cut are left so high, that it is really, to a lover of a beautiful lawn and fine trees, truly disgusting. Dress up all the wounds of the trees here; keep the whole up as long as possible—cut not a single tree out till they are dead in the top and root—before losing the timber, pollard such trees as die in the top, while they live in the roots, so as to become ornamental —plant in close, and fill up the blanks, as advised and directed in plantation No. XXIV. No one will dispute the claims of the trees in this field, both as to shelter and ornament, and they deserve a degree of attention more than has hitherto been paid to them.

No. XXVII.

——— *Field.*

THERE are a few detached old trees in this field, some of them Pollards, gathering most beautiful tops, and becoming, and will soon be very ornamental. Every one of them should be carefully propagated, and not one of them cut out. Nothing can be more ornamental than a few detached trees in a field when once they come to have proper tops.

No. XXVIII.

THERE is a clump of fine young wood in one corner of this field, which should be carefully reared up as standing trees, and has been by far too long in thinning. For this purpose it should, as soon as possible, be very carefully gone over and thinned out to about twelve feet, tree from tree, taking care always to spare and leave the most healthy and ornamental long-lived trees; say Oak, Spanish Chesnut, Beech, Elm, and Ash; of these thin out alternately of all the kinds in ten years; after this thin out a second time to twenty-four feet, tree from tree, at which they may stand to maturity.

No. XXIX.

Round Stable Paddock, at Powerscourt.

IN this field there is a magnificent Ash tree, which is not only well worthy the attention and care of the proprietor, but is also worthy the admiration of strangers visiting Powerscourt. I suppose it the largest tree of the kind in Ireland; at all events it is the largest I have heard of, and it is the fourth largest tree of Ash I have ever seen either in Scotland or England; it is still healthy and growing, and I have no doubt but it may increase in size for a number of years. This grand natural production

girths, at the smallest part of the bole, twenty-one feet, and a little higher and lower, thirty-feet; though the main trunk be but short, it sends up two magnificent and truly beautiful stems, measured close to where they spring from the main trunk, each will girth within a trifle of the trunk at the smallest place, and then run up to an immense height—taking this wonderful tree in all, its solid contents, is not less than from 600 to 700 cubic feet. By taking down a small part of an old wall, which I understand is now of no use as a fence, and one or two trees, it would open up a most beautiful view of it from the present approach to the mansion, from which approach I think a private foot-walk should be made to this sublime and grand tree. There are a few blemishes in it, which will hasten its decay; these should be immediately dressed up and covered over; supposing the timber of this tree to be all sound and wholesome, and cut down, at the present selling price of such timber, its value would be L.97 10s. Where is the proprietor that would not protect to the very last stage of decay, such a treasure of value and of ornament, handed down to him by his forefathers? Surely nothing but dire necessity would induce him to do otherwise than transmit it to his posterity. A little above this tree, in the same field, are two very fine Planes at present, (21st. April,) in full blossom; these early announcers of the approach of reviving spring are well worthy of notice and attention. There are two large Ash trees which stand right in face of these Planes, one of them in particular is spoiling, and should be taken down, to give full scope and view from the approach road; both of these Ash trees may, without the least injury to the look of the place, and a great benefit to the two Planes, be taken away; if so, they should be taken out by the roots. There are a number more of fine old trees in this field much in want of being properly pruned, and the blemishes dressed up. The clump of young trees in this field should be

thinned out immediately. From the length of the trees it mus be done sparingly and gradually, taking particular care to leave always the longest lived, most healthy, and what is likely to be even the most ornamental trees, and rear them up to maturity; save the Spruce Firs and take away the Larch, where there is a choice, as the Larch Firs will not live to be large trees in this situation.

No. XXX.

Racecourse Field.

THE whole of the detached old trees, with the strips round the outsides, should be carefully kept up as trees; not one of them taken down as long as they will stand. There is also a round clump of old trees in this field which should be kept up; from its exposed situation nothing should be cut out of it; where blanks, fill them up as recommended in plantation No. XXIV. In this field is another young strip of planting; this on the south requires a little thinning, and if done judiciously will be of great advantage to it; from its exposed situation this must be done gradually, till the trees stand at equal distances of about eighteen feet, tree from tree, at which on the top of this bank and on all the exposed places, they may stand as a finished plantation; where there is a choice take away the Larch Fir, and spare any other tree in preference. The trees in this field, called Daly's Wood, or Bottom of the Course, are for the greater part very thriving, and will grow till they become of very large size in such a situation. Here with great propriety and advantage a few trees may be taken out, which should be done this spring, and the remaining trees dressed up. The particular trees that should be taken out here were pointed out as I went along, say about 20 in all; so that they need no farther description. It is always to be understood, it is

only the dwarfish and unthrifty, and such as never will be proper trees, and are at present injuring their neighbouring trees that are to be taken out. The strip along the dyke side, on the public or common approach to the mansion, together with the row of trees outside, say on the south of said approach, forms a fine avenue, and screens the common from the private approach. I may here be permitted to observe, that I am an advocate for keeping up entire, all old avenues of large timber trees about a mansion or seat of a proprietor, and I am of opinion, that nothing gives a place an air of antiquity more than they do, and should never be cut down but at the discretion and desire of the proprietor. In this, however, I differ from almost the whole of my profession of modern improvers, whose plans are to cut these up into detached groups. The present Earl of ——— sent a professional Gentleman from England to improve his woods, &c. on his estate in Scotland, and he cut all the fine old avenues of trees leading to the Palace of ——, into small irregular groups of about three and five trees, which, when the Earl came down and saw, he would have given, as he himself expressed it, the half of the whole property to have had these beautiful avenues of trees up again. I could give a great many more instances of this kind. No one that ever saw the indescribably beautiful avenues of lofty trees at and near the Castle of Inverary, the seat of the Duke of Argyle, would believe that any man in the possession of his rational senses would ever cut down such beautiful avenues.

No. XXXI.

———, *West to the Mansion.*

In this clump there have been, although a considerable time ago, a great many trees cut out; it must be evident to the most superficial observer that this is its misfortune, and will in the

end prove its ruin. It has already been the means of many being brought down, by which storms will bring down many more. There is at present one of the best of the Beech trees blown over, and allowed to lie on its neighbouring tree, which is not only destroying it, but if allowed to lie much longer, when the tree gets into foilage and heavy in the top, the first gale of wind will take both trees down, and a great blank added to those already made. There is in the same place a large Oak in the same state; both trees should be immediately taken away. Fill up the blanks here with Oak, Spanish Chesnut, Spruce and Silver Firs. When a tree is blown over on its neighbouring tree, not a moment should be lost in taking it down; for if allowed to lie, ten to one but it will bring down the tree it lies upon.

No. XXXII.

There is here some very fine trees; two of the Elms very much destroyed by cutting off the branches; if this was necessary, as is said to be the case here, why not cut them close in to the trunk of the tree, and dress and cover up the wound. Nothing can be more disgusting to the eye than to see trees mangled in this form, nor can any thing be more ruinous to the health of the tree. All such branches should be immediately cut close, and dressed up as recommended in plantation No. IV.

No. XXXIII.

Trees about the Garden.

As these trees both afford excellent shelter to the Garden and Mansion, and are also very ornamental, the whole of them should be kept up as long as possible with the greatest care,

and those only taken out after they become perfectly dead before their timber grows useless, and other trees put in and reared up in their places; dress up their wounds as in No. IV. All trees for shelter should be kept closer on the ground than in a plantation, particularly about a Garden. Supposing large trees to be singled out to 24 feet, tree from tree, or at most 30 feet, they should always be thinned out so as another tree might stand in the gap betwixt each of them, and underwood should be reared betwixt them, covering the naked trunks of the large trees.

XXXIV.

——— *Hollow.*

Here are some very fine old English Elms, almost the whole of which should be reared as long as time will allow them to stand. In one place where four trees stand in a group, two of the Elms may be taken out, say the two worst of the trees, but nothing more. Here are some very fine healthy young Spanish Chesnuts, which should be reared up with great care. As these trees are excellent for ornament, live to a great age, and grow to a great size, as also very profitable to cut down as timber, in all places of the plantation where these are, they should be cultivated with great care. One Beech tree will be found here, marked to be taken off one of the best of these Chesnuts, which should be done immediately. There has been a fine healthy Spanish Chesnut cut here, which is a great pity; almost any tree should be cut to give scope to this; but being in an open place I am thoroughly at a loss to discover the reason for taking it out. Some other large trees have been taken out here, for what purpose I cannot think of. There is a fine bank of wood here, down towards the river side, which wants a little thinning, and if done judiciously will much improve it.

Take out all the bad Ash, dress up the stools, and allow them to come up as underwood, which will be fine shelter for game, &c.

No. XXXV.

——————'s *Bank.*

The clump on the north-east end of this bank is fast falling into decay; this has been hastened by the careless manner in which it has been thinned. On an exposed bank of wood of this kind, nothing should be cut out of it after the trees arrive at a height of sixteen feet, when the thinning of all such should be finished. This bank will wholly extirpate itself if not soon filled up; it should be immediately planted, say all the blanks with the Oak, Spanish Chesnut, Scotch and Spruce Firs.

The strip along the foot of this bank wants a little thinning, and if done in a proper manner will much improve it. When there is a choice, take away the Larch Firs, as these will never be ornamental trees here. From the height of the trees, it must be thinned cautiously and gradually. The round clump joining the —————— strip should be immediately filled up by planting in Oak and Spanish Chesnut. There is a Beech tree, beside a Scotch Fir, dead in the top, it should be cut over as a Pollard, which will save the lives of both trees for many years. When the Pollard is finely topped, take away the Scotch Fir, as this is a very conspicuous knoll. The old trees should be all saved and nursed up with care and attention.

No. XXXVI.

A Bank near the House of Powerscourt.

The old trees on this bank are a very great natural curiosity; there is to be seen many fine healthy and large trees, two

Beech and a Scotch Fir, growing out between each, and that to within, not feet, but a few inches of each other, and each tree in some of them averaging in girth upwards of seven feet. This, I confess, is wholly new to me. I have never, in all the course of my profession, met with any thing equal to it; say different kinds of trees growing as it were from the same root, and that too in a straight row, to such a size and degree of perfection. These trees are well worthy the inspection of strangers. Observe, it is no rarity to see one of the same species grow from the same roots to the size, &c.; but trees of different species, and so much so as Beech and Scotch Fir; these trees are worthy the proprietor's attention, and should be kept up with care. Two of the Beech trees here should be topped as a Pollard about 17 or 18 feet up from the ground, allowing all the branches to remain under that height. This will give scope to all the three, &c. See plantation No. IV. In the bank along the foot on the north side, are some fine Spanish Chesnuts, which should be relieved to get scope to become ornamental trees. This bank being a continuation of the last bank, wants all a little thinning. Strangers visiting the beautiful Mansion of Powerscourt, should never leave the place without seeing these trees.

No. XXXVII.

——— *Field.*

In this field are some very fine healthy old trees, and it would much improve the look of the place to turn it into a lawn of trees, which should be done by taking away some of the bad looking and worthless of the trees, and to dress up properly those to remain. There appears to have been some very fine large old trees taken out here, from their stools, which have been left above the surface, uncommonly high; these old

roots should be grubbed out; it would give more pasture and a much better look to such a field; nothing on the river side should be touched. The best and largest of the trees have been formerly cut here, but let it be understood what I mean should come out, is the very worst of the trees, leaving as many of the best trees as are necessary, for the purpose of having a fine show of lawn timber trees. All trees in a lawn where the surface is even and always in pasture or pleasure grounds, should be singled out to about 40 feet, tree from tree, and that too as regular as possible.

No. XXXVIII.

——— *Bank.*

This bank is much in want of thinning, which if done judiciously would much improve it, as it is covered chiefly with Ash. Those cut out should be dressed up in the stools to rear underwood, as also should the Alders, so as to cover the whole bank with underwood. There is a marsh at the foot of the bank which should be drained, by deepening and always keeping open the run of water, and making some open casts into it; when done, plant in the Saugh tree, say Huntingdon, True Willow, and Black Poplar, which will grow well here, and be both profitable and ornamental. See the great profits and advantages of planting tree Willow and Poplar elsewhere in a following plantation.

No. XXXIX.

——— *Meadow.*

On the south-west side of this bank are some very fine evergreen trees of Scotch and Silver Firs, which are great beauties

so near the mansion; also some hardwood trees, all of which should stand as ornamental trees. There is a bank of wood at the foot of the pond requiring a little thinning; also some draining to obtain good trees, which is a great object so near the pleasure ground. One or two badly topped dying Ash trees may be taken out as has already been noticed, nothing is more ornamental about and near a Gentleman's seat than trees, and of various kinds, evergreens should bear a predominate part, say Scotch, Silver, and Spruce Firs, as these are always the same, green in winter.

No. XL.

———'s *Bank.*

This bank is a very fine spot for wood, but there is not at present half a crop on the ground. Take away all the dwarfish and unthrifty trees, as also the most of the Alders. Drain the wet places; but where dry, and can be kept dry, plant with Oak, Spanish Chesnut, Elm, and Plane. In places where it will be always damp, plant Tree Saugh and Poplar. In this bank by the river, is a particularly fine old Oak; on the top, a fine Silver Fir, which are specimens of what perfection trees can be brought to. In all plantations where the trees are unshapely, and not healthy, it is much better to cut them down, and rear up trees, either more profitable, or more ornamental; nothing betokens a place going into decay or disrespect, more than to see trees of this description remaining, when by a little attention the ground could be covered with fine healthy thriving trees, where the soil and situation are favourable for them.

No. LXI.

——— *Bank Young Plantation.*

This Bank is of excellent soil for rearing trees of almost

every description; and as may be seen from the trees on it, will rear them very rapidly, although the Larch Firs, where they have stood good, have got the ascendancy of the others, still from the exposed situation of this bank, the Larch will never come to be a profitable, ornamental, or long lived tree here. The top of this bank, in particular, commands a most extensive view of the adjoining country.

I am of opinion that a triangular row of Spruce and Silver Firs along the top of the bank, should be planted and reared up to maturity, as standing timber trees; for this purpose, plants of this kind should be carefully put in, and reared up at fifteen feet, tree from tree, which when up, will cover the look of the place as if it were a forest; wherever it is necessary to fill up blanks, that should be done with Spruce and Silver Firs; rear and thin, and cut the other trees as they come up, gradually and to regular distance, as recommended in No. XXII. say ——'s Glen, the young part of it, leaving a variety of the kinds already planted, only where there is a choice, take away the Larch Firs. The belt of old trees on the top of this bank, is both sheltering and very ornamental. There has been a very considerable number of these trees cut lately, which from their stocks, appear to have been very healthy; had there been some, and that but a very few, taken from the back side of this belt, it would not have been so bad, but the trees taken are from the front of the bank, and the very worst place they could possibly have been cut out of. I would not have thought there could have been a man found in the three kingdoms, in possession of his right mind and his eyes open, that would have done such a thing; any person wishing to see the absurdity of such work, need only look at the roots of the trees cut, and see where they are cut from, the roots of which are covered over with turf, which shows plainly the thing was no sooner done than repented of, and the error discovered when to late. Large

old trees should never be cut down in any conspicuous situation without due deliberation.

No. LXII.

——— *Young Plantation.*

This plantation, particularly the old part of it, wherever there are blanks, should be filled up with Oak and Spruce Firs chiefly; Larch Fir is not at all a tree suited to this place, as they will not live long, nor come to maturity on this soil and situation. As this plantation should be reared to timber trees, to stand as a wood or forest of trees always full and covered with underwood in the young part of it, there is by far too many Scotch Firs, and in some places there is nothing else; where this is the case a part should be taken out, and hard wood trees put in their place. Put in the hard woods, say Oak, Ash, Elm, and Plane alternately at twenty-eight feet distance, tree from tree, keeping a Scots or Spruce Fir between each. As a wood or forest, at this distance, they may stand to be reared up to maturity, keeping the ground always full with underwood. Where the Firs are already begun to kill the hard-wood, they should be taken out, and this gradually, as advised in ——'s Glen, Young Bank, No. XXII.—there is a number of the hard wood plants, say Beech particularly, in the oldest part of it, that require pruning very much; trees at the height they have arrived to, may with safety, and should be pruned too, for their future shape as a tree, but when they get older the pruning knife should never be applied, except in cases of necessity. By a judicious pruning of trees, or more properly may be called plants, at this height, say from two to four feet high, the future shape and health of the tree may be in a great measure determined. To keep underwood in plantations of this kind, is very useful for the health and growth of the old

trees to be reared to maturity, and by having the underwood of Oak, it may be turned to excellent account by cutting it over every twenty years or so, as an Oak Coppice, &c. at same time affording excellent shelter for all kinds of Game.

No. XLIII.

——— *Young Plantation.*

THIS is a most excellent soil, although very poor and inclining to moss, and the situation high and bare for miles round it, for rearing trees of every description; although the situation is bleak and exposed, yet in planting a large field of it together, it may be made a fine plantation, and will be of the greatest use here in covering the cold, bleak looking, naked moor, and will not only warm, shelter, and cover the bare appearance of the place itself, but will ornament and beautify the whole of this bare looking country for many miles distant. For which important purpose, not only what is already planted, but a great deal more should, and could, with great propriety and advantage be added to it, as the land for the most part is adapted for no other purpose, and never can be brought to pay one shilling, for twenty that it will do in planting. Let us consider a plantation to be made and reared here solely for profit, and to insure a regular annual return of profit; it would be to plant the whole, or part of it on a proper principle for a natural Oak Coppice (and I may observe, by the way, that the coldest and most barren places of these mountains, will carry Oak Coppice) and cut over (after being brought to a proper system) every twenty-four years; dividing it into twenty-four regular yearly cuttings, it will produce at the rate of seven pounds Sterling per acre of annual rent; and that too, for any length of time without expense of keeping; but to keep the fences good, which can be very easily done in this place,

where the stones are got for the lifting up; were this plan to be adopted, the method for planting and converting it into a natural Oak Coppice, is to plant the whole after being enclosed with Oaks at eight feet distant, plant from plant, with a nurse tree of Larch or Spruce Fir between each, which should be cut away when the Oaks get the height of four feet, and at the age of fifteen years, or thereabouts, the whole of the Oaks should be cut; however it may be proper to observe, that the Oak and bark will not pay so much the first cutting, as there is but one stem from the plant in place of three or four, that can be reared from the stocks in after cuttings. (See this fully explained in my Forester's Guide.) After the first cutting at fifteen years, they should be cut every twenty-four years thereafter. Observe, that an Oak natural Coppice requires no shelter after the first cutting, however exposed the situation may be; but to ornament it as a plantation in this place, all along the top, sides, and foot of the hill, should be skirted with standing trees of Spruce, Scotch and Silver Firs; say a double row planted and reared up in a triangular form, which would always keep up the view or look of it as a standing plantation, and the interior to be cut even, as aforesaid, as coppice, and maiden trees left every cutting amongst the coppice, which will always give the whole the look of a plantation. But to have this always as a wood or forest, it would be well to rear trees of every description on it, and then I would recommend to plant Oak, Spanish Chesnut, Scotch, Elm, Ash, Plane, Scotch, Spruce, Silver and Larch Firs alternately. To give variety to its look at a distance, these should be planted, thinned and reared up as described in ——'s Glen, No. XXII. keeping always the ground full of underwood. Should the proprietor prefer this last plan, I would advise that the triangular trees of ever-greens, as formerly recommended, be planted round the out sides. I would give a preference to the first plan, as it

may be made to answer both the purposes of ornament and profit.

The present enclosure, already made here, requires planting up, which should be immediately attended to in one or other of the proposed plans; it is well enclosed, and only needs to be kept full of plants to make it a plantation; where the heath is very strong, it should be cut down before planting, and where the soil is very bare, plant Larch Firs, in order to make a soil. See my Forester's Guide on planting waste lands. As I said before, a great deal more land should be planted here, particularly the field immediately before this enclosed plantation—it is really worth being looked into and planted, as very great advantages in many respects would be gained to the property by it; but this does not come under my authorized survey at present.

This is an exceeding high exposed situation, yet the plants in the small clump of planting made on it was doing extremely well on some places although very little attention seemed to be paid to it.

LXIV.

Wood Park, South Side.

Here again I am under the disagreeable necessity of lifting up my standard against a system of planting, &c.—though I have not the slightest doubt of hazarding the remark, that every professional man the least skilled in planting would do the same, although the task is exceeding painful and irksome; yet I am totally at a loss to know how I am to get at the kernel without first breaking the shell; this shall for the present be passed over, as much as possible; nor will I take any notice of the waste of plants and expense of planting; in the finest of soils, most sheltered situation, at eighteen inches, and two feet

plant from plant, planting into a bog in the very midst of a runing stream of water, planting on the hill where it is exposed, at three and four feet distance, with large plants of Scotch Fir, &c. The roads formed through this side of the park are a great improvement, being most tastefully and admirably laid off, which serves to improve, facilitate, and dignify the whole place. It must be plain to a demonstration, and agreed at all hands, that to have standing ornamental timber trees here, is all and every thing that is required, and to obtain which, the great and leading object to be kept in view; and to obtain this, a selection of the longest lived and most ornamental trees, at proper distances, should have been, and should yet be planted. This desirable object may easily be obtained at a trifling expense, safely, permanently, speedily, and beautifully by the following method: Plant the Oak, Spanish Chesnut, Scotch Elm, English Elm, Ash, Plane, Beech, Spruce and Silver Firs, alternately, at from thirty-two to thirty-six feet distant, plant from plant, in all the blanks betwixt the brow of the hill, say, as far up as the highest of the old trees, and down to the river; enclose them singly with small stakes, warp these for two feet up with the small branches of Larch Fir, which will last for ten years,* and most effectually protect them from deer, hares, rabbits, (although these were as thick as the ground would support them) and also from the storm, blow as it will, till they were trees, of such a seize as to be completely out of danger. Being thus securely sheltered and protected, they will grow as much in one year, and that too without the risk of misgiving, as they otherwise would, not to mention the present planting, which to say the least of it, is no planting, as they will in three years, the soil being excellent. But to the expense--50 trees will be sufficient for each acre, as a lawn of ornamental timber trees, particularly

* I have known the warping of paling by branches of Larch Fir, keep out hares, rabbits, &c., for twenty years from a nursery with very little help.

here, these 100 acres will take 5,000 plants, at 25s. per thousand, is L 6 5s. the expense of planting and enclosing singly, for workmanship alone, supposing the wood for the stobs to come from the estate, as the present railing, including nails and workmanship to the full, L.66 5s. add plants, L6. 5s. is in all L.72 10s.—I am not aware if there will be 100 acres of the bank referred to, after deducting the ground already occupied by trees, to plant, but suppose less or more, if so, the whole will be planted and protected effectually without risk or farther trouble, for L.72 10s.—I am doubtful if the present system has not cost four times that sum. If large clumps or clusters of planting is to be done on the top of the hill, enclose these clusters singly with stone or paling, &c. If with a wooden paling, I would recommend the small stob-paling, as by far the cheapest, say four stobs to a yard, as it only uses such thinnings or crops of timber as cannot be sold, whereas the sawing strong rail-paling* takes wood that can be sold readily for a high price, besides the expense of sawing which is very high. When the whole is planted, which may be easily done in one season ; turn the deer in, or indeed they should never have been out of this side, as will be afterwards shown, nor will it in its present state be a very easy matter to keep deer out. Plant the cluster on the top in the exposed situations, with Oaks chiefly, at eight feet distance, and large old plants with good roots cut over before being put into the ground, then they will never shake with the wind—nor slacken them in the roots till they have gathered strength to support the tops, nor will they ever require replanting. Spanish Chesnut, Elm, Ash, and Plane will do equally well with the Oak ; by this method, plant in Larch and other Fir seedlings

* This is a species of paling with very strong stobs at 12 feet distant, and 2 rails of spars of sawing timber, 4 inches broad by 2 inches thick, which is very expensive, nor is it so a good fence as the small paling.

betwixt them, not older than two year seedlings. But this method, &c., as almost every other improvement, according to my judgment, pointed out and particularly described to Mr ——, as I went along, whose propensity to Forestry, and his anxiety to be serviceable and useful to his employers, qualifies him, in my opinion, as a very fit person to put in execution any or all of my plans, should the proprietor think proper to go on with them.

To prevent strangers from making the planting in the water and marshes proverbial, the plants should be instantly removed and the places drained; in any very conspicuous place, a Pollard tree could be transplanted in. The few trees to be taken out from amongst the old ones, were almost to a tree, fixed on in presence of Mr ——, who I have reason to trust without doubting, will see to them; they must of course be few and far between. Any boss tree, or so far decayed as the bark and timber will then be worth nothing to sell or cut, it would be much better to cut it as a Pollard, (see No. IV.) as it may in that case become ornamental, while its intrinsic value is now almost nothing. As to making a plantation of timber-trees by Pollards, &c., the present —— ——, Lanarkshire, built a new mansion in a field of about 100 acres, where there was not a tree; he in two seasons transplanted 500 trees, many with their tops whole, 50 feet high, and not 20 of them misgiving, made a complete lawn of large timber-trees in two years; many noblemen went to see, and were admirably delighted with the heaven-like grove, which was formerly barren waste land,—as inferior to that on which I am now treading, as sand is to fine flower. In Lord Morton's Deer park 500 Pollards have been put in within these five years, and not 50 out of the 500 have misgiven, and only enclosed for a few years. Young healthy trees, from 10 to 29 feet of wood, make excellent Pollards to transplant, and are most beautiful trees in two

or three years; many specimens of these are to be seen on this same property, which have also been pointed out as we went along.—See method of transplanting, &c. in my Forester's Guide.

No. XLV.

Wood Park, North Side.

The whole of the old trees, which are for the greater part Oak, between the Waterfall on the river going upwards, about the Summer-house, and between it and Mr ——'s house, should all stand. To every lover of fine scenery and fine trees nothing on this earth could be more enchantingly delightful. A certain author says, "What would heaven be without trees?" The bank of trees from the Waterfall down towards the new Cottage, or March of Bahanna, with the exception of a very small portion of it near Bahanna, is growing on land totally unfit for any thing but young trees; indeed in the far greater part of it there is scarcely a particle of grass to be seen growing. This bank of wood has been very injudiciously thinned by taking good healthy trees, and leaving the unthrifty, not to mention the shameful cutting by leaving the roots of many of them more than a foot above the ground, as well as many unaccountable blanks and gaps. The greater part of this bank has been at one time cut over and reared up from natural shoots, particularly towards the top of the bank, where almost to a tree they are growing from the old stool. This bank would admit of a partial thinning, but in its present state, while the deer are at large in it, it would be doing the greatest injustice to take a single tree from it, as, notwithstanding their stinted state, many of them if dressed up would grow from the old stools; and here from the stony and rocky surface it would not be so easy to enclose and keep up a single enclosure round

them as on the other side. As it is plain the deer have no meat on this bank, run a temporary paling or fence down from the dyke above to the new dyke at the back or north of Mr. ——'s house, nearly in a straight line to the upper corner of the dyke; also a temporary paling along the foot of the bank to the east, and cut over all the old natural stools of Oak along the top, and for nearly half-way down the bank, leave all the fine old healthy trees along the foot; as also all the healthy trees growing from the plant in the bank. Dress up for the growth the stools of all cut; plant up the whole blank ground on the top of the bank up to the dyke in the same manner as directed in the other side; and in a very few years the whole of this bank, which is fit for nothing else, will be covered with fine timber trees, a number of which should be always kept up for ornament, and the ground kept full of Oak Coppice, it not being fit for pasture, and cut out every twenty years such as is fit for barking; the ground here being quite different from that on the other side. This should be attended to immediately, and in a few years, instead of old scraggy unthrifty trees, there will be fine healthy beautiful trees, which could be reared up for any purpose. As the deer will never have meat here, they should be immediately turned over to the other side, and part of the expensive paling taken to enclose this bank in a temporary way, as described. Indeed it will be found a very difficult task to keep the deer out of the other side. If any planting was to be in the side above the Waterfall, it should be enclosed singly as on the other side, so as the deer may have the whole range on both sides, except this bank, and this too, if attended to, after the first twelve years at longest. Keep all the Alders on both sides of the river for ornament as long as they will stand up. Observe, that in coppicing this side there must always be a number of standard trees kept in it, say at sixty feet, tree from tree;

this will always keep up its look as a plantation of ornamental trees, and the coppice or underwood covering the rugged surface, which to cut every twenty years will also be very profitable. The truly bold and sublime prospect which this park, as it is called, presents to a stranger entering its gates, with the lofty grandeur of the fine trees mounting to the top of the hills on both sides, together with the Waterfall, cannot fail to make the contemplative mind pause and admire.

No. XLVI.

Glen Wood.

HERE is an exceeding fine, although small spot of natural Coppice Wood, unfortunately chiefly Birch; but where there are Oak growths, although they have never been either dressed up for the growth, or cared for, yet they are fine. The whole of this little enclosure should be cut over this season, and the stools of Oak carefully dressed up for growth. The whole of the Birch should also be cut over, barked, and the timber cut into barrel-staves, and the Birch growths extirpated, and the whole ground filled up with Oak, converting it into Oak Coppice, for which both the soil and situation is admirably adapted. The Oak barking should be commenced immediately, and finished before the Birch, as it will do to bark, so late as the month of August. The timber of the Oak is remarkably suitable for making into cart and chaise wheel spokes. For the method of barking the Oak, Birch, and making the timber into spokes and staves, see it briefly described in my Forester's Guide. As this wood is of full age for cutting, it should be attended to without delay. The profit to be derived from natural Oak Coppice cut every twenty-four years, may be beautifully illustrated by this wood. I suppose it to be thirty years, or not exceeding that age; and there are many stools in it

worth 15s. wood and bark, which the same ground could have reared up to the same age, say at eight feet, tree from tree, or stool from stool, which are 800 odds on each acre, supposing the ground to be covered with Oak alone, at 15s. each stool, is L.600 for the crop of thirty years growth, which is L.20 of annual rent for every acre, as the refuse of the wood and additional stools will be sufficient to pay the expense of manufacturing; but to bring it down to cuttings at twenty-four years, and suppose only the one half, allowing all the rest to go for the interest and the annual rental, &c. Here is L.10 of yearly rent per acre for land, I suppose, not paying the proprietor 10d.; but where will the very best land pay like, or nearly like this; when reserve trees are kept, and these healthy and strong for two or three cuttings, and sold with the coppice, it generally pays more. A skilful person should go through before beginning to cut, and mark with paint, or number with a wood-iron a few of the best and healthiest of the Oaks as standard trees; these should be selected chiefly from the plant or seedling and not from a stool, at as equal a distance as possible; when cut over, the fences should all be made good, and the whole blanks; and when the Birch is planted up with Oak, a great part of which may be done by layring from the growths of the stools; for which consult my Forester's Guide on planting. This is worthy of notice and immediate attention. The cutting and barking should be begun immediately.

No. XLVII.

——— *Coppice.*

THE Coppice on the two farms is said to be only seventeen years old, and it is truly wonderful to see such fine growths of Oak as in many places here, at that age; it neither having been dressed up properly when last cut for the growth, nor

has it been properly cared for, since it has been mostly pastured, so that a proper profitable crop of Oak cannot now be reared on it for this cutting; the whole should be cut over also this season, the Birch extirpated, properly enclosed, the blanks planted up, and afterwards cared for and done with as recommended in the preceding coppice of No. XLVI. A very fine choice of reserve trees can be obtained here, which should be carefully marked; here is also a great deal of more fine land for Oak. Natural Coppice could and should be added to this.

No. XLVIII.

——— *Wood.*

The most of the trees in this wood are on the decline; from the situation it occupies on the Estate it is by no means particularly ornamental, being scarcely seen from any quarter; at least it commands no particular view, it should in my opinion be more the object of profit than otherwise to the Estate, and besides, to rear very large heavy timber trees here, it would cost almost half their value to get them out, there being no road, nor could a road be made to take very heavy trees out without great expense. The chief object here is Coppice, which this bank of wood should this very season be converted into; if allowed to stand much longer, by far the most of the trees in it are losing in value every year they do stand; a few of the very best of the Oaks should be selected and marked out as standard reserve trees, and the rest cut over and dressed up for the growth. It is most likely a number of the dead Ash trees, &c. will not spring, in which case Oak plants should be put in, but when the Ash will grow it may be very profitable to rear up from the old stool. This bank is well enclosed and needs nothing more but to fill up the blanks, &c. when cut and cleaned, and attended to in every respect as

in No. XLVI. —— Wood. When cut it should be extended down to ——'s Coppice, planting up all the banks, making one enclosure.

No. XLIX.

Leackenderry Hill.

Having examined this hill, although a little out of my way, not being called on to report on land fit for planting, where there is no planting, but this part being so closely connected with Glencree, it was impossible I could shut my eyes from taking a view of an object so interesting to the estate. There is no part of the country, however remote or distant, that a view of this hill cannot be got from. It must be confessed it must be sublimely grand, that to have it covered with wood and not only considered as a great ornament to the estate to which it belongs, but to the whole surrounding country; it would be also a great national beauty when viewed from the ocean. This hill will carry trees of any kind for the most part of it, but should be planted on the top with ever-green Firs, running the planting of these round the south and upper sides, connecting it with the banks of the river in the Glen; and here I should suppose on the hill and in the Glen on both sides, from upwards, not less than 1200 acres of fine Coppice land could be planted, which from its locality to sea carriage and good roads, supposing Oak bark to keep only its present low price, when properly converted into Oak Coppice, and cut in yearly hags or cuttings, say about 50 acres yearly, would bring annually to the proprietor not less than from seven to eight thousand pounds Sterling, and that for all time coming, without any expense but the first enclosing and planting, which will be but a trifle. This is certainly well worth serious consideration, that by laying out a few hundred pounds of the

rental for a very few years, say for eight or ten years only, on this and some other places, it would insure to the property, from ten to fifteen thousand pounds of additional yearly income, from lands that are not bringing just now L.100 of annual rental to the property. This is equally valuable, and indeed more so, than buying as much more land to the estate, as no purchase of land could ever insure a rental of L.10 per acre, besides beautifying the country as well as the estate, and giving bread and clothing to many a poor labourer and his family.

No. L.

Dargle Glen.

This being so conspicuous a place, and of so much resort, from the nobleman to the lowest mechanic; in the present state of the property, to cut and carve with it as a plantation of trees, in either sense of the word, would be, I am much afraid, treading too much upon sacred ground; one thing must be plain to every one, that had the present trees upon the ground been attended to in time, they would have been much more valuable, ornamental, and praiseworthy. The trees have been allowed to remain by far too long and too close, and have lashed each other so much that very few of them have good tops, the generality of them are more like poles than trees.

To improve it as a wood, laying aside for a moment the idea of it as a place of public grandeur, admiration, and amusement, leaving always the trees on the sides of the walk untouched, select carefully the very best and most healthy of the trees, at or as near as can be thirty-six feet distant, tree from tree; mark all such as are to stand on the ground, dress them carefully in the roots for the growth, cut away the others, watch the young growths in every stage, with the greatest attention, and rear up all the fine healthy shoots, thinning, pruning, and

rearing them up early* to be a fine ornamental tree. In very few years, many of the trees will be found dying, and gaps or blanks will be the consequence; but to take it in time in this way, a very few years only, (as from its well sheltered situation, the natural shoots will make great progress) say not exceeding ten, when beautiful, healthy, and ornamental trees would be covering up the ground with underwood, which in this place would keep its foilage all winter and be infinitely delighting. This is the only method to insure a lasting crop of fine trees in this place, and to hand them down to generations yet unborn; or secondly, suppose another case which will always keep up the look of it as at present, or nearly so; thin out to eighteen feet, tree from tree, taking care as aforesaid to extract the worst of the trees, dressing up as aforesaid the stools of those cut for the growth, and rearing up always the fine shoots for trees from the young growths; but observe in this way the standard, these being so close on the young shoots they will neither grow so rapidly, nor be so healthy shoots. I for my part would prefer the first plan; but thirdly, cut over every third tree as a Pollard, taking the best of the trees for Pollards; in two or three years when these have begun to form and make beautiful tops, therefore to give them room, take away the tree doing them most injury, and the next year or so, take the tree on the other side, &c. always to give it room, and it will no doubt soon form a most beautiful top, and become a most ornamental tree. Thirdly, is the plan to beautify the place in three, or not exceeding five years, when fine ornamental trees may be obtained, but at a sacrifice of some valuable timber. The first is the most proper plan, and will secure the most healthy and permanent crop of fine trees. The whole

* In rearing a young natural shoot of Oak, &c. if taken in time, it can be trained up to any shape, &c. See Forester's Guide. "Train up a child in the way he should, or is wanted to go, and when old he will not depart from it." This holds good in trees.

rests as a matter of opinion and choice with the proprietor. To allow it to go on in its present state much longer will be ultimately to extirpate it; although many trees will come on, many more will die. I would give the preference to the first plan. What is said here will be found illustrative as to trees in many glens in the three kingdoms, where they may have been neglected as to the means of recovery.

No. LI.

——— *Bank.*

This bank of wood, chiefly Oak and a few Birch, had been at one time cut over as Coppice; not having been properly attended to in the thinning, &c. when young, it has done the trees considerable harm. The only thing to do to improve it now, is again to cut it over as a coppice; in doing so, a few of the very best and most healthy of the Oaks should be singled out and marked as reserves to stand amongst the coppice; a considerable degree of skill in making the selection is necessary; after having marked the standards, cut the whole over, extirpate the Birch, fill up the whole ground with Oak, which can be done by layring from the young shoots of Oak. In cutting, the stools should be properly dressed up for the growth. This should be done immediately; say this season, as it is losing in value, both as to timber and bark every year it is allowed to stand in its present state. See method of cutting, &c. No. XLVI. See the method of layring from the young growths, properly and fully explained in my Forester's Guide.

No LII.

Nursery.

Where there is so much to be done in the way of planting,

it would be of the greatest imaginable utility to establish on every estate a small nursery, not so much for rearing from the seed, as this is attended with considerable expense, but to buy in seedling plants from the seed bed, transplant them in it till they are ready to plant into the field or wood, where they can be kept short or long, to rear them to answer the purpose of every soil and situation where large or small plants may be required; this will also prepare them for the situation, soil, and climate. Seedlings in ordinary years, unless there is an uncommon scarcity, can be bought at from 2s. to 4s. per thousand, average prices of all kinds; this will at least be a saving of 20s. on the thousand of plants, and the little ground they occupy for one, two, or three years is comparatively nothing; I should suppose one-fourth of an acre sufficient in the meantime, unless some extensive new plantations are to be made. From what I have already said as to the incalculable advantages to be derived from planting, it would be unnecessary to go much farther into the affair at present; I cannot help wondering that some society or joint-stock company does not embark in a system of planting waste lands, especially in this country, (Ireland,) where excellent land for rearing timber can be got for a mere trifle, and every thousand pound laid out, would bring a return in twenty years of more than L.7000 A company of this kind, termed if you will the Irish National Planting Company, would be worthy a British King to be at the head of it—of a Prince, the noblemen, gentlemen, every lover of his country, and every lover of gain to be members thereof.

No. LIII.

It may not be considered improper here to mention another means of improving the waste lands, and bettering the condition of the poor in Ireland besides that by planting, which put to-

gether, would not leave any of the waste lands of that country unproductive. It is a well-known fact, that among the many grievances complained of by the poor inhabitants of Ireland at the present time, there is none more glaring than that of the want of clothing,* this is evident to the most superficial observer, on landing in that country, whether in the city, the village, or any part of the country. Nor is it in their body clothes only that the poor, or rather what may be termed generally speaking the working class in that kingdom seem so miserable, but also in their bed-clothes, and in their uncomfortable cottages; every person that has travelled in Ireland, and has taken particular notice of the state of the poor within, as well without doors, will assert the fact that the want of clothing is of itself the cause of great distress among the lower orders of the people in that country. To remedy this great evil, I beg leave to suggest what appears to me best calculated to effect so desirable an object, and thereby to ameliorate the distress of the sufferers. To all who have the means of knowing the real state of Ireland, they will most readily allow that the great cause of the want of clothes of every description among the poor, is their inability to purchase either the cloth or the raw material; the wool at present produced in Ireland being of a good quality, and of course higher in price than what the poor people can afford to pay for, consequently they remain in many cases the pictures of misery. Now, were the mountainous parts of Ireland farmed after the manner practised in the Highland districts of Scotland, the inhabitants of Ireland might be clothed fully as comfortably as the lower orders of people in Scotland generally are. It is a well-known truth, that the labouring classes of people throughout the whole of Scotland make a decent appear-

* A certain author says, that it is no uncommon thing to see a poor person in Ireland exchanging clothes with a field scare-crow, that is a thing drest up with old clothes in the fields to fright the birds from the crop.

ance in their wearing-apparel, and have in their cottages plenty of comfortable blankets for themselves and families. This is chiefly owing to the abundance of wool, which at all times is easily and cheaply procured in every part of the country, oftentimes as low as from 5s. to 6s. per stone of 24 lib. This arises from the mountainous, and most rugged parts of the kingdom being stocked with numerous flocks, of what is called Scotch black-faced sheep, which produces abundance both of wool and mutton, thereby enriching the country with food and clothing. Every labouring family in these parts of the country buy a little wool from the sheep-farmer, which the wife and younger branches card and spin. They procure a little Alder, Larch, and Rowantree, and other barks, with which they die it different colours, they send it to the weaver, and have excellent clothes of their own manufacture, for all descriptions of apparel, and in which they appear at kirk and market equally well clothed, or at least equally well screened from the inclemency of the weather with their noble proprietor. I have myself wore cloth, and particularly stockings of this manufacture that did not cost me one-fourth of the price, and far outstripped the wear of English cloth and stockings. The poor Irish labourer and even many of the mechanics go to market and buy second-hand, or old clothes; if they do not exactly fit, which is most likely, they go to pieces the first day's labour; thus they are ever in want and ever in rags. Many thousands never had a shoe on their feet, nor a coat on their backs made to fit them; only think of the poor pityable figure they make dressed up in such rags, for so they may be called, before coming to such a market; think not that I speak hyperbolical, or out of disrespect? No, far from it. From the hospitable way I was received in all parts of Ireland, I love the Irish and I love their country; what I say is a notorious fact, and so much the more pity. Now what is the case in Scotland, might also be the case

in Ireland, were the proprietors of mountainous land in that country, to turn their attention to the stocking their hill-pasture with the very same kind of sheep, that is now grazing upon all the mountains of Scotland; I recommend the Scotch black-faced sheep, not with a view to turn off any of the sheep the country is already possessed of, but I recommend that kind of sheep, as being the only domestic animal that will thrive well upon lofty mountains which are exposed to snow and the winter storm, as many of them have been known to lie below the snow for eight or ten days and still survive and thrive afterwards. The most rugged mountains in Ireland, even those that are of little value to either proprietor or tenant at present, could without much loss of time be turned to advantage by pasturing with these kinds of sheep, and will be found the best means for clothing the poor of that country; nor is any extra labour requisite except herding, and one man with a sagacious dog, will be found capable of attending to a thousand of these sheep; this is frequently the case in Scotland. Scotch ewe lambs of this kind could easily be exported from Argyleshire, the distance between that part of Scotland and Ireland being so very trifling. The very remotest and poorest islands of Scotland are now stocked with these profitable sheep, which greatly enrich the country, and have brought in a great extent of land which was formerly of little or no value, either to proprietor or tenant; so much so, that before, many proprietors did not well know the bounds of their own ground. The Irish mountains have advantages over the Scotch both as to climate and rich natural grass, which are far superior to the coarse grass and cold climate of Scotland; so that if any considerable number of lambs were imported into Ireland, they would in a few years multiply to that degree, that wool in that country would soon be both as plenty and cheap as in Scotland. As one foot of pasture ground produces more natural grass than

three does in Scotland, so that the poor inhabitants of Ireland would soon be equally well clothed with the Scotch people. I am well aware that in many parts of Ireland great numbers of horned cattle are reared annually and sent across the Channel for the English markets; but that does not in any way prove that more sheep cannot be reared throughout Ireland, without lessening the rearing of horned cattle; the reverse will be found to be the case. I speak from personal knowledge, when I say the worst mountain in any part of Ireland upon which black cattle cannot feed, would be found sufficient pasturage for sheep Scotch bred, only let them be allowed in the winter season, when the snow falls very deep, to come down about the foot of the mountain as is commonly done in Scotland during the storm. I am also aware that these sheep will find pasture and thrive among rocks and on parts of the mountains, when even the native Irish sheep will not. The Scotch black-faced sheep is well-known to forage for their own support in all seasons of the year, without any other feeding than the very coarsest of grass, and heath produced on bare rocky mountains. If therefore such sheep were brought to the worst lands in any part of Ireland, they would be found most advantageous to the general interests of the country. No scheme can be devised to improve the mountainous parts of a country and which requires so little capital, or even so little labour in the execution of the whole project, as that which I have proposed. In order to convince the proprietors of mountainous grounds in Ireland of the propriety of turning their attention to their own interests, and to the general good of the country, in stocking their mountains in the manner proposed. I beg to observe the rapid progress made in all the Highland counties in Scotland since the middle of last century. At that time and for many years afterwards, there was not a single black-faced sheep known in any of the counties north of the Friths of Forth and Clyde. Some

small white-faced sheep and goats, with some few horned cattle of an inferior size, and little horses, were all that the Highland counties produced in those times, and from such stock the rents could be but trifling. The first of these black-faced sheep were introduced into the counties of Dumbarton and Argyle, in the year 1757, by a shepherd from the South of Scotland, named Thomas Harkness, who came to, and settled in the district of Cowal, Argyleshire, who then only brought a small flock of this kind of sheep. This man proved careful and industrious, and was of course encouraged by the proprietors of land. He added to his flocks to that degree, that he was enabled to purchase free lands in that same division of Cowal, to the amount of L16,000; this is a very hilly and small part of the county of Argyle, and is much exposed to storms in winter, particularly snow; since the above time, this district alone contains and grazes no fewer than 78,000 of these sheep, a good proof that they have been found profitable.

No. LIV.

PLANTING.

The following was on some Farms in a part of the country exceedingly bare for many miles, in Berwickshire.

It will be at once seen from what I have already said, that all the blank ground within the present boundaries as already described, should be planted up. The ground occupied by these clusters or lots of wood, and the line of roads by which the timber and bark has to be removed, cannot be planted up till spring 1828, after the wood and barks are all removed; but the proposed enclosures should be immediately made, and the blanks betwixt these Hags planted up, and all new ground, first spring; as the natural growths from the cut Stools will

grow much faster than plants will do. I need hardly observe, that the whole of these blanks should be filled up with Oaks; and where the rocks are very near the surface, Oak acorns may be put in; converting the whole into a natural Oak coppice wood; and if attended to after the first cutting, it will pay an annual rent of at least L.7 Sterling per acre, and that without any expense for time to come, but keeping good the fences. I may here observe, although a little out of the way, that nothing would ever pay on this property better, nor could any thing be more advantageous, both as to ornamenting the whole country; but particularly the farms; also clothing this naked part of the country, and afford excellent shelter for the cattle and sheep on these farms,—to plant the whole of the bank, from the ravine down from the shepherd's house already noticed, to the stone dyke running down to the Berwick road on ——— farm, that is to say, carrying the fence from the upper corner of the the new dyke at the east end of the last Lot, to the aforesaid dyke on ——— farm, running up from the public road; this would only take in land not fit for carrying any other kind of crop, and the whole would carry excellent wood, either to rear up to maturity as standing timber trees; or to cut regularly as a coppice natural wood; besides beautifying the whole country. It would not only be profitable to the proprietor as a crop, but also add greatly to the value of the property; besides affording excellent shelter to cattle and sheep on these farms, which is so much wanted on these bare looking farms. Were this plan to be adopted, I would advise that all along the top of the bank, between east and west, be planted a double triangular row of Spruce and Scotch Firs, which will always show as a plantation of timber trees, particularly in winter, and will warm and shelter the whole property; as far as they go, the Spruce and Scotch Firs should be planted alternately at four feet distant, plant from plant, and regularly thinned out to stand, at

not more than twelve feet when finished, and toped down when too tall. I may also add, that the ground proposed from the easter Lot, sweeping north-east, facing the public road, should be planted and reared up as standing timber trees; and here for this purpose, should be planted the Oak, Spanish Chesnut, Scotch Elm, Ash, Plane, Spruce, Silver and Scotch Firs alternately, to give variety to its look. Permit me here to observe by the way, that were a few belts, strips, or clumps of planting properly laid out and reared on these farms, so far from taking off the yearly rental, that it would actually add to it as affording shelter for cattle, &c., and add fifty per cent. of intrinsic value to the property. I have marked off, at same time valued a few reserve trees so as they may be either sold with the lots or at any time after, as the proprietor then may think proper; these are left more with a view to show what was on the ground at cutting time, than to add to the value of next cutting, as many of them will never be much better, and may be cut away after the other trees come up, to cover the bare face of the bank. From the manner that these trees are marked, along the top of the bank, it will show that it was more with a view to improve the place than to make money of it, that the present proprietor cut the woods. The value of each of these reserve trees are given, each by themselves, so that either the whole or any number may be taken out at any time, and their value known; a list of those trees, with the value of each is given; with this is also sent the Articles of Sale with regard to cutting, &c.

No. LV.

OLD WOOD PARK.

Surveyed in 1823, *before the Publication of the Second Edition of the Forester's Guide.—This is in a very cold bare country.*

FROM the nature of the soil of this field, being a cold till

bottom, I am of opinion that it will not rear up trees to a great age, or full maturity; but I am of opinion, that it is well adapted, both as to soil and situation, for a natural Oak Coppice Wood; and as every foot of the ground in the field will carry Oaks for that purpose, and from its locality to a bark market, if properly attended to, it will pay at the rate of L.5 sterling, per acre, of annual rent, allowing the Oak bark to keep its present reduced price. The method, I would advise for planting, &c. is, after having cut an open drain in the middle, from south-west to north-east, (say two feet six inches wide at the top, one foot at the bottom, and two feet deep,) and then running a plough through every furrow, as it now stands in rigs, to the depth of seven inches, at least, leaving them open; planting the hollow sheltered places with Oaks alone, at a distance of six feet, plant from plant, and on the level part of the field, Oaks at six feet, putting in a plant of Larch Fir betwixt each; these Larches to be allowed to remain only for six, or not exceeding seven years, in order, not so much to shelter the Oaks, as to make and enrich the soil for them afterwards, and then the Larches to be all cut out. The whole of the trees of every description, on the west side, within the field to be cut down, and the stools of the Oak and Ash properly dressed up for the growth;—the stools of the Birch to be extirpated. The Ash, although of bad quality just now, the natural shoots will then be quite a different quality, and nearly equally profitable as Oak in a natural Coppice Wood; besides, the Oak and Ash on this part of the field will fill up a great part of the ground, without being at the expense of a single plant, by layering from the young shoots, a plan though new, (and opposed by the Nurserymen) I have practised with the greatest success, and to great advantage, for these some years back. The method is by layering down on all sides where there is blank ground, some of the young shoots from the old stools, and leading them out,

year after year, till they fill up almost any quantity of blank ground, and every year the layer will make a push of two, three, and sometimes four feet in one season; being more than an Oak will do from the plant in five years, and far less risk of their misgiving than from the plant. The method of planting the level part of this, or of any other field, is by running them in angular lines from the way the trees are most exposed to the weather, (such as from the S. W.) as for a standing plantation. When planted in this way, the trees can be thinned out to great advantage, in a triangular form, so as never to lash each other with the wind, and at same time where shelter is required for the adjoining fields, which is much wanted on this Estate; as in this way, by paying proper attention to the thinning, there is no way of looking into the plantation, but trees strike the eye, without seeing through it; nor are the trees, when thinned out, so apt to be blown down. This way of planting is also of equal advantage in a natural wood, as when the stools fail in this triangular form, it is much easier getting the stools to occupy new ground by layering, and also keeping a proper crop upon the ground for time coming. This method of triangular planting will be attended with still greater advantage in narrow strips, and belts of planting are intended chiefly for ornament and shelter, as in this case the trees will stand the weather far better, and afford more shelter.

No. LVI.

Strips and Belts in a very bleak bare part of the country.

The Strips and Belts of planting on this Estate, are for the most part, in a very rapid state of decay, and if not remedied soon, will be nearly extirpated, and others will show great gapes in them. One thing much against them is, many of them have been too narrow at first, and being totally neglected when

young, and having been prunned, in the place of being thinned; they have for the most part been reared up more like poles than trees, and great numbers of them never will be proper trees, either for shelter or ornament; the very thing they are altogether required for on the Estate. Strips or Belts of planting for this purpose, particularly where the ground is cold, and the country bare, and embellishment and shelter the only object to be kept in view, should never be planted less than 100 feet broad, so as 4 or 5 trees may be reared in the breadth, to maturity, at proper distances, and so as underwood may be reared up beneath them when large trees, which will not only afford excellent shelter for game, but be very profitable, as it can be regularly cut every twenty years; besides underwood is particularly beneficial to the growth and health of trees; in strips and belts of this kind it keeps the soil moist and affords more shelter. Some of these strips which consisted wholly of Firs, and are rapidly decaying, it would be better to cut out altogether, and plant them anew. Others of them where mostly hardwood trees, and where some of them are likely to live, and maintain the respectability of the look of the strip, for some years, such trees should be carefully selected and marked off to stand, and the whole of the polish and dwarfish trees to be cut and immediately disposed of, and the stools of all the Oak, Ash, Elm, and Plane trees properly dressed up for the growth, so as to rear up either for standing trees to supply the place of those taken out, or to convert into Coppice for underwood. But where none of these kinds of trees are, it would be proper to put in Oak and Spanish Chesnut plants; but where these kinds are, although only one in number, the whole breadth of the strip may be filled up by layering as aforesaid, without the expense of planting. By a careful attention to this, the strips and belts may, in course of a very few years, be brought into a proper state. Trees to stand in belts of this kind should never

be prunned after they are above six feet high, and thinned out before they exceed sixteen feet, to proper distances, in order to give them room to branch out.

No. LVII.

——— *Young Plantation.*

From the light and shallowness of the soil, together with the exposure of the Plantation, I am of opinion it will not rear timber trees to maturity, particularly the Larch Fir, which will grow pretty well for the first twenty years or thereby, till they arrive at a height of about twenty feet, when the tops will most likely give way. I am of opinion, that the only trees that will come to maturity here, will be the hardy Oak, the Plane, and Scotch Elm, even these will grow very slow, and be a long time before they come to perfection as timber trees. I would recommend as the most profitable for the Estate, that this Plantation be wholly filled up with Oaks, and converted into a natural Oak Coppice; to effect this, put in plants of Oak at eight feet distant, plant from plant, amongst the Firs; the plants to be strong well rooted plants, not less than three years transplanted from the seed-bed, and then properly pitted in the ground, and cut over close by the surface the second spring after being put in; the blanks annually filled up with Oaks; a belt of Firs, &c. may be left round the outsides, say about thirty yards wide; after the Oak plants, either by cuttings or otherwise, arrive at a height of from six to eight feet, the whole of the Firs in the interior of the Plantation to be cut out. In fifteen years after the whole has been filled up with Oak, the whole of the Oaks may be cut over; this cutting may only bring about L.15 per Acre, for Wood and Bark; but it will be hastening the whole forward for another more profitable cutting, which will bring at least three times that sum per Acre,

at the same age; but I would advise the next cutting to be at twenty years old, dividing it into four hags or yearly cuttings, which should bring in at least L.2000 every hag or cutting, for time coming. It may be advisable in some places of this Plantation, where the Larch Firs appear to be the most predominant, to allow them to come up to the age of fifteen years with the Oak, at which age it will be seen what sort of trees they are likely to be; and should it be necessary to cut them at this age, the bark will be of good quality, and will pay as a crop, though not near so well as the Oak.

No. LVIII.

——— *Old Coppice.*

THIS Bank of Coppice is upwards of thirty years old, the trees left on it have been most injudiciously and erroneously selected for any thing like profitable wood, being mostly Beech and Elm. I beg here to observe as I go along, that Oak, and nothing else but Oak, is the only profitable trees for Coppice cuttings, and wherever such a plan is intended, nothing else should be reared. I am of opinion, however, that the trees in this part of the Bank, as in some other parts, should be reared up as standing or ornamental timber trees, and for this purpose, nearly the same method as in these may be observed, with this difference, that it abounds with the natural growths of Elm and Oak from the old stools, and Beech from the plants; as the value of all these kinds of trees, say Ash, Elm, and Beech, wholly depend on their sizes, wherever they are the predominant trees they should be cultivated till their timber become valuable; this being the case here, it would by no means be advisable to cut it over as a Coppice at present, even admitting the supposition that it was intended to convert it into that purpose in future. As the natural stools of Elm, Ash, and what

of Oaks there are, have never been thinned, so that many of the shoots have died altogether, and many more become stinted; the whole of their stools should be immediately gone over, and thin away all the dead and dying shoots, and such as are evidently hurting each other, leaving not more than three of the very healthiest and most thriving of the shoots on every stool, and when pressed on the sides by another tree, not more then two, in this way to rear them up to be timber trees of value; observe, that what of the Oaks require to come out, must be barked in their season. If it should be thought advisable afterwards to convert this into a Coppice, after these trees have been brought to be of some considerable value, the whole, only a proper number of reserve trees left, should be cut down and the ground wholly filled up with Oak. I must here be permitted to observe, before proceeding farther, that it is my opinion, from the conspicuous situation this Bank occupies on the Estate, from east to west, no part of it should ever be coppiced, as the whole of it will carry timber trees for ornament to maturity,—the sublimely grand and venerable old trees about the House and in this Bank, I would term perfections of nature's beauty. Continue always to rear Oak for underwood amongst the large trees, to cut every twenty years, both as profit and shelter for game.

No. LIX.

——— *Strip.*

This Strip is by far too narrow for a strip of standing timber trees for shelter and ornament, for which purpose it is solely intended; I may here observe, once for all, that all strips and belts of Planting to be made for shelter and ornament, should never be less than from 35 to 40 yards wide; but to preserve this Strip as much as possible, almost all the hardwood trees,

with the exception of the Beech, should be cut over; only a few of the very best and most promising to be spared, and allow them to come up from the roots, which they will do very rapidly, and then thin them out to stand in a triangular position across the strip; it will be found that from the natural growths, much better trees can be reared to maturity, and they will also stand the exposure much better; of which growths, timber trees should be reared at a distance of twelve feet, tree from tree, and all the rest kept as underwood; all the Spruce Firs should be saved as standing trees, and a few more put in, leaving the Larch till the other trees come up, when they should be cut, as they will not come to maturity in this Strip. For the proper methods of rearing standing timber trees from natural shoots or stools, see my Forester's Guide on converting Natural or Coppice Woods into standing trees.

No. LX.

Approach to the House.

THIS Bank is for the most part very thriving and healthy; but by far too thick; although the soil is good, and will rear up any kind of trees to maturity, yet it is impossible it can bring to maturity any thing like the number now on it, while only four feet, tree from tree; besides, they would never have the proper figure of ornamental trees. As a selection of good trees could be got from the present crop, for the purpose of ornamental trees, they should be correctly marked off at proper distances of 16 feet, or as near as can be, and all the other hardwood that will spring from the roots, carefully cut over for the growth, and reared as underwood. Where there is nothing but Larch Firs, when they are cut out to the aforesaid distance, other plants should be put in, say Oak and Spanish Chesnut

chiefly. Indeed I would recommend where hardwoods are to be put in, that the greater part should be Spanish Chesnut; I would also recommend a triangular row of Spruce Firs to be put in along the top of the Bank. The whole of the Larch Firs should be gradually cut out, as they will not be long lived trees in this situation. The greatest care and attention should be paid in singling out the trees that are to remain; to take special care to have them always standing in a triangular manner, up and down the bank, cross ways, so that in viewing it from the road, the top or bottom of the bank, there will be always a standing tree seen, and no blanks or gaps observeable. This method of thinning is worthy of particular attention in this bank, as by this plan it will always appear fully covered with trees, and yet they will have room. When it comes again to be thinned, say in ten or fifteen years, the same method should be attended to.

No. LXI.

Approach to the House.

THE trees on both sides of this avenue are, for the greater part, very healthy and thriving, some beautiful Spruce, and a few fine Larch in the hollow should be cherished with care, also one along the top of the Bank; on both sides the Scotch and Spruce Firs should be kept up, the greater part of the hardwood cut over for underwood, keeping the selection of trees to be reared to maturity as timber trees at distances of fourteen feet, and in the bottom of the avenue at ten feet on each side, length ways, but fourteen feet up the Bank; keeping always a tree in the centre, between the two outside ones, in a triangular manner; these trees having two sides to branch out, will rear up closer than in the interior of the plantation. The young clump below the Fog House,—here, a few of the

best Larches may stand as timber trees, as they will come to maturity in this situation, the whole should be immediately thinned out to distances of eight feet, tree from tree, and in five or six years after, to sixteen feet, tree from tree, making an equal selection of all the different kinds already on the ground, to give variety to its look; the soil here being a deep loam, will carry any kind of trees. The trees on both sides of the road, up to the gate, are already particularly beautiful. It would even add to the grandeur of this ravine, if the tops of the trees were allowed to fall out and hang over the road, forming a kind of canopy; this may be in so far accomplished by allowing a tree to press the top from the inside, and when plants are to be put in, plant them in a sloping direction; a prop may be put in the inside to bear on the top of the tree outwards; were very tall trees to meet in the tops here, it would be sublimely grand in a sun shine day, as the passenger walked under them, or in a moon light evening.

LXII.

——— *Young Plantation.*

This is a very healthy thriving young clump of planting, and from the soil and situation, is remarkably adapted for planting, and will carry trees of any description to maturity; as there is a variety of kinds planted, nothing is required but to thin out such as are upon the ground, of every kind alternately, to twelve feet, tree from tree, except along the top of the Bank; where ever there is a choice of trees, take away the Larch, saving the hardwoods and Firs in equal numbers in the interior of the Bank, to give variety to its look, always rearing up hardwood for underwood amongst the large trees. In ten years after, a selection of fine trees may be made, to be thinned out to twenty-four feet, as large ornamental trees, and those to be taken out

year after year, till they fill up almost any quantity of blank ground, and every year the layer will make a push of two, three, and sometimes four feet in one season; being more than an Oak will do from the plant in five years, and far less risk of their misgiving than from the plant. The method of planting the level part of this, or of any other field, is by running them in angular lines from the way the trees are most exposed to the weather, (such as from the S. W.) as for a standing plantation. When planted in this way, the trees can be thinned out to great advantage, in a triangular form, so as never to lash each other with the wind, and at same time where shelter is required for the adjoining fields, which is much wanted on this Estate; as in this way, by paying proper attention to the thinning, there is no way of looking into the plantation, but trees strike the eye, without seeing through it; nor are the trees, when thinned out, so apt to be blown down. This way of planting is also of equal advantage in a natural wood, as when the stools fail in this triangular form, it is much easier getting the stools to occupy new ground by layering, and also keeping a proper crop upon the ground for time coming. This method of triangular planting will be attended with still greater advantage in narrow strips, and belts of planting are intended chiefly for ornament and shelter, as in this case the trees will stand the weather far better, and afford more shelter.

No. LVI.

Strips and Belts in a very bleak bare part of the country.

The Strips and Belts of planting on this Estate, are for the most part, in a very rapid state of decay, and if not remedied soon, will be nearly extirpated, and others will show great gapes in them. One thing much against them is, many of them have been too narrow at first, and being totally neglected when

young, and having been prunned, in the place of being thinned; they have for the most part been reared up more like poles than trees, and great numbers of them never will be proper trees, either for shelter or ornament; the very thing they are altogether required for on the Estate. Strips or Belts of planting for this purpose, particularly where the ground is cold, and the country bare, and embellishment and shelter the only object to be kept in view, should never be planted less than 100 feet broad, so as 4 or 5 trees may be reared in the breadth, to maturity, at proper distances, and so as underwood may be reared up beneath them when large trees, which will not only afford excellent shelter for game, but be very profitable, as it can be regularly cut every twenty years; besides underwood is particularly beneficial to the growth and health of trees; in strips and belts of this kind it keeps the soil moist and affords more shelter. Some of these strips which consisted wholly of Firs, and are rapidly decaying, it would be better to cut out altogether, and plant them anew. Others of them where mostly hardwood trees, and where some of them are likely to live, and maintain the respectability of the look of the strip, for some years, such trees should be carefully selected and marked off to stand, and the whole of the polish and dwarfish trees to be cut and immediately disposed of, and the stools of all the Oak, Ash, Elm, and Plane trees properly dressed up for the growth, so as to rear up either for standing trees to supply the place of those taken out, or to convert into Coppice for underwood. But where none of these kinds of trees are, it would be proper to put in Oak and Spanish Chesnut plants; but where these kinds are, although only one in number, the whole breadth of the strip may be filled up by layering as aforesaid, without the expense of planting. By a careful attention to this, the strips and belts may, in course of a very few years, be brought into a proper state. Trees to stand in belts of this kind should never

be prunned after they are above six feet high, and thinned out before they exceed sixteen feet, to proper distances, in order to give them room to branch out.

No. LVII.

——— *Young Plantation.*

From the light and shallowness of the soil, together with the exposure of the Plantation, I am of opinion it will not rear timber trees to maturity, particularly the Larch Fir, which will grow pretty well for the first twenty years or thereby, till they arrive at a height of about twenty feet, when the tops will most likely give way. I am of opinion, that the only trees that will come to maturity here, will be the hardy Oak, the Plane, and Scotch Elm, even these will grow very slow, and be a long time before they come to perfection as timber trees. I would recommend as the most profitable for the Estate, that this Plantation be wholly filled up with Oaks, and converted into a natural Oak Coppice; to effect this, put in plants of Oak at eight feet distant, plant from plant, amongst the Firs; the plants to be strong well rooted plants, not less than three years transplanted from the seed-bed, and then properly pitted in the ground, and cut over close by the surface the second spring after being put in; the blanks annually filled up with Oaks; a belt of Firs, &c. may be left round the outsides, say about thirty yards wide; after the Oak plants, either by cuttings or otherwise, arrive at a height of from six to eight feet, the whole of the Firs in the interior of the Plantation to be cut out. In fifteen years after the whole has been filled up with Oak, the whole of the Oaks may be cut over; this cutting may only bring about L.15 per Acre, for Wood and Bark; but it will be hastening the whole forward for another more profitable cutting, which will bring at least three times that sum per Acre,

Observe the trees in this plantation were only about twenty years old, and stood at distances of six feet only, tree from tree, when the survey was made and the report given.

LXV.

General Remarks on the Plantations, from No. LIX.

I have all along, as I said at the beginning, considered the whole of the Plantations, in so far as it is attainable from the present crops on the ground, to be reared up as standing plantations, as inseparably attached to the lands, in which respect they add (and while kept on it, will ever do so) to the value, at least four times more than their intrinsic value as timber; and it is of the very greatest importance carefully to propagate them as such.

I.—It is agreed at all hands, that to have large ornamental trees, they must have room to spread out, and wherever a thining out for this purpose is suggested, no time should be lost in having it finished.

II.—One chief beauty of a tree is, its being well cloathed with branches, and it is wonderful to observe what nature does for trees in this respect, if they have equal room, the equality of their branches is truly surprising in healthy trees, even granting that one side, which is generally the case, unless in large plantations, be exposed to the storm, particularly the Oak, the Spanish Chesnut, the Plane, the Ash, and almost all the Fir tribe; but the branches of the Beech and Elm will often get sickly on the exposed side.

III.—Prunning is always detrimental to the health and figure of a tree, and the prunning-knife should never be put on a tree after it is six feet high; therefore, when it arrives at this height its every part, both as to trunk and top, should receive all the shaping and prunning that is necessary, or that human

of Oaks there are, have never been thinned, so that many of the shoots have died altogether, and many more become stinted; the whole of their stools should be immediately gone over, and thin away all the dead and dying shoots, and such as are evidently hurting each other, leaving not more than three of the very healthiest and most thriving of the shoots on every stool, and when pressed on the sides by another tree, not more then two, in this way to rear them up to be timber trees of value; observe, that what of the Oaks require to come out, must be barked in their season. If it should be thought advisable afterwards to convert this into a Coppice, after these trees have been brought to be of some considerable value, the whole, only a proper number of reserve trees left, should be cut down and the ground wholly filled up with Oak. I must here be permitted to observe, before proceeding farther, that it is my opinion, from the conspicuous situation this Bank occupies on the Estate, from east to west, no part of it should ever be coppiced, as the whole of it will carry timber trees for ornament to maturity,—the sublimely grand and venerable old trees about the House and in this Bank, I would term perfections of nature's beauty. Continue always to rear Oak for underwood amongst the large trees, to cut every twenty years, both as profit and shelter for game.

No. LIX.

——— *Strip.*

This Strip is by far too narrow for a strip of standing timber trees for shelter and ornament, for which purpose it is solely intended; I may here observe, once for all, that all strips and belts of Planting to be made for shelter and ornament, should never be less than from 35 to 40 yards wide; but to preserve this Strip as much as possible, almost all the hardwood trees,

with the exception of the Beech, should be cut over; only a few of the very best and most promising to be spared, and allow them to come up from the roots, which they will do very rapidly, and then thin them out to stand in a triangular position across the strip; it will be found that from the natural growths, much better trees can be reared to maturity, and they will also stand the exposure much better; of which growths, timber trees should be reared at a distance of twelve feet, tree from tree, and all the rest kept as underwood; all the Spruce Firs should be saved as standing trees, and a few more put in, leaving the Larch till the other trees come up, when they should be cut, as they will not come to maturity in this Strip. For the proper methods of rearing standing timber trees from natural shoots or stools, see my Forester's Guide on converting Natural or Coppice Woods into standing trees.

No. LX.

Approach to the House.

This Bank is for the most part very thriving and healthy; but by far too thick; although the soil is good, and will rear up any kind of trees to maturity, yet it is impossible it can bring to maturity any thing like the number now on it, while only four feet, tree from tree; besides, they would never have the proper figure of ornamental trees. As a selection of good trees could be got from the present crop, for the purpose of ornamental trees, they should be correctly marked off at proper distances of 16 feet, or as near as can be, and all the other hardwood that will spring from the roots, carefully cut over for the growth, and reared as underwood. Where there is nothing but Larch Firs, when they are cut out to the aforesaid distance, other plants should be put in, say Oak and Spanish Chesnut

may be observed in the corner west from the cross dyke, till where it narrows into a narrow strip, with this difference, that all the healthy thriving Scotch Firs should here be saved till the projected young plants, in the field on the south side, come up; here I have been rather more sparing of the field than the line by the plough furrow, as the old strip is of sufficient breadth already; I have marked the letter P. thus, on a standing tree in the strip, &c. and making the young plantations of nearly an equal breadth, from the boundry dyke on the north, all along, westwards to Lord ———'s approach gate; here the whole trees should be spared, only taking away such as die, till the young plantation comes up. It may be here necessary to mention the method of sale for such thinnings, &c., and a reference to this will suffice for other plantations of the same description on the estate.

The only plan to sell wood of this kind, and that too attended with the least risk as to payments, is a country sale, in a country so poplous as this, and the best and most profitable method for the proprietor of effecting a sale is, to mark and number off the trees to be sold, with a wood-iron, putting them into lots of from three to ten trees, according to their sizes and value, taking special care to have every tree marked according to its proper designation, such as Lot 1, 2, 3, and so on; fix on a day of sale, advertise it through the country by hand-bills, &c. sending them to all the coal-works, &c. round, and sell each lot by public auction, to the highest bidder. Each lot, before the sale, is commonly valued, which is absolutely necessary when the Lots are large, as well for the satisfaction of the proprietor, as for fixing the upset price; but in the case of the woods before us, I do not think, for my own part, that it is necessary, because having a person who is a judge to conduct the sale, he will at once know whether or not it brings its value, unless the proprietor wishes to be satisfied before hand of the

probable value. As there may be more to dispose of, than supply the country demand in one season, whenever this is seen to be the case, the sale should be adjourned, for three months at least; a good deal of skill and caution is required in putting the trees into proper lots, to make them take a ready sale, and bring the most possible money for them, and the only plan for this purpose is, to put all the most valuable trees in lots by themselves, and these generally in very small lots, by no means mix the good or valuable trees with the trash, as useful wood will always have a competition of offerers, and bring its value, and often times fully more; whereas inferior timber oftentimes does not. All different descriptions of timber should be loted and sold separately. The whole should be loted and sold off standing; I have always found timber of this kind sell best growing; besides, being mostly Scotch Firs, were they to be cut down they would soon spoil, and the whole behoved to be sold off at once, whether they brought their value or not; whereas when standing, they can be sold or not, as there is or is not a demand. The whole must be sold under proper articles and conditions of sale, binding the purchaser as to cutting, removing, paying, &c.; a copy of the customary articles, in sales of this kind, will be given at the end of this book.

Another plan, and I am of opinion the most advantageous for this plantation, as also for the improvement and value of the estate; as the greater part of the Firs are at their best, and indeed have arrived at that stage of size and growth, at which Scotch Fir trees, for the purposes they are applied to; as timber is more valuable than if they were of rather a larger size, and although they were to stand for twenty years longer, they would not be worth one sixpence more per tree, supposing the prices of Fir Timber to be the same, although I am also doubtful if many of them would ever live other twenty years. The plan would be to mark off, and reserve the whole trees,

except such as are dying, along the east and north outsides, to the breadth of twenty yards or thereby, and cut the whole of the rest over, and convert into an Oak natural Coppice Wood, that is, fill up the ground with Oak where there is none, to be cut every twenty-four years; in this way, it will pay an annual rent of L.7 10s. per acre for time coming, without any expense of plants or planting, and the belts on the outsides will always keep up its look as a plantation for shelter, &c.

LXVII.

Strip along the Road Side.

From about a chain length south of the approach road, north to the old wood, this strip consists chiefly of old Scotch Firs, which in many places want thinning; but from the height of the trees, and their neglected state, there would be the greatest danger in doing so, that is to say, thinning, as it would be a mean of breaking down many of them with the cuttings and make great gaps in it, which, in some instances, is already the case; the most effectual method would be to cut the whole down, widen and plant it up anew; but this would make a great blank for a long time. I am therefore of opinion it should stand as long as it will stand, taking always away the dead trees, and continue to fill up the present and all other blanks as they become naked, with Spruce Firs, Oak, Spanish Chesnut, Ash, and Plane trees; plant at eight feet, plant from plant, thin out at six feet high, to sixteen feet, at twenty feet high, to thirty-two feet, for large ornamental timber trees; keep always the ground full of Oak Coppice for underwood, to be cut over every twenty years. Thin out the young part of it, at the south end, to eight feet, clearing away the Firs from the hardwood plants. Nothing looks worse than strips and belts

of planting along a public road, when they are permitted to fall into decay, which is the case with two many of our strips and belts of planting about half a century old.

LXVIII.

Young Plantation.

In this plantation, as well as in all the other young new made plantations, there are far too many Larch Firs; it would be much better to take a great many out just now, and put in other trees, to be reared up to maturity, as ornamental standing timber trees, &c. and thus get a finished plantation at once, rather than wait on it; a number of the Larch Firs will transplant yet. As this plantation, adding to the old belts, will form the whole, when once up into a clump or cluster of plantation, rather as a strip or belt, which from its proximity to the House of———, and no other that may be called a plantation on this side, it should be reared up full with various kinds of trees, particularly such as will become ornamental long lived trees; when the Larch Firs are taken out, as aforesaid, Spanish Chesnut should be put in; here I may observe, by the way, that my reasons for recommending Spanish Chesnut so much, is first, because it is the most ornamental of all the hardwood species, the Oak not excepted; second, it grows equally as fast, and faster than many of the hardwood trees; third, it grows to a larger size than many, and lives to as great an age as any of them, and its timber is as useful and valuable as the Oak, and its bark nearly so, and upon the whole, it is a tree, although not generally known in this country, but on the soil we are now treading, it will grow equal, if not superior to any other, and will also grow natural by cutting, as the Oak; keep the ground always full, and thin out for the first time, when the trees arrive at a height of from six to eight feet, to twelve feet, tree from

tree, at which they may stand in this situation as a finished plantation, keeping a variety of all kinds of trees on the ground, to be reared up, and in connexion with that part of the old strip on the north; always thin the trees to stand in a triangular form across the strip. This young plantation was almost wholly of Larch only about five years planted, which should never be planted in small clumps or strips in an exposed situation.

LXIX.

OLD PLANTATION.

This Plantation is in Argyleshire, and exposed to the Western Ocean.

From the situation this cluster (or clump, as all such are generally termed) of Planting occupies on this farm, it is of the greatest consequence to rear it up as a standing ornamental clump of timber trees to maturity; in the Report, it shall be scrupulously attended to, to effect which, attend to the following system: On this soil and situation, Larch Fir is by no means a tree for ornament, nor will it ever come to maturity here as a timber tree, this may be seen by the dwarfish and unthrifty state of the Larch Fir Trees already on the exposed part of this plantation, while every other description of the Fir tribe is healthy, vigorous, and thriving; in thinning, wherever there is a choice, the Larch Firs should be taken out, and every other tree left in preference to it, this should be particularly attended to where there are Scotch, Spruce, and Silver Firs, as these kinds will thrive and live to a greater age than the Larch; besides, they are much more ornamental, and afford much more shelter in winter; Oak, Plane, and Ash, are the only kinds of hardwood that should be reared; for this purpose a careful selection of the best and most promising shoots of Oak should be made of the natural growths from the stools marked

off as standards, and reared up as timber trees, and the healthiest and most thriving of the Plane and Ash, with a few of the best of the Beech, should also be marked off as reserve trees; a very careful selection of the above kinds should be made, and marked off to stand, the rest cut away, and those should be selected at equal distances, or as near as can be got, at sixteen feet, tree from tree, keeping the outside row next the public road a little closer, say about twelve feet, they having room to branch out on every side, will do closer. In the low part of this clump, where there is nothing but Larch Fir, and where, indeed, both the soil and situation are better adapted for Larch than the high parts of it; here the Larch is past its best, and dying, and requires to be taken away, and longer lived trees put in their places, and I would advise, as by far the best plan, before bringing this plantation to a finished state of improvement, to cut out all the Larch Firs immediately; many of these trees have been spoiled by allowing the drains to fill up, and the water to stagnate about their roots, which has killed some, and been the principal and only cause of many more being blown down; indeed, neglecting the state of the drains, thereby allowing water to overflow the roots of the trees, is sufficient to kill any tree. These drains, which appears to me, to have been most properly and effectually done at one time, should be immediately reopened, cleaned out, and the water properly let off. I have marked, as I went along, a number of trees which should be taken out in the high part of this clump, which should be cut out immediately with the Larch Firs, and in summer, the Oak shoots that are to be reared up as standing timber trees, should be marked off, and the rest of the shoots taken away and pilled for the sake of the bark, this being done, the thinning properly finished, as aforestated, and the ground drained, the whole of the blanks at present, with the ground, where the Larch Firs are cut from, should be

planted up next season, and which should be done with plants of Oak, Scotch Elm, Plane, Scotch, Spruce, and Silver Firs alternately, at eight feet, plant from plant, and when they have arrived at a height of from eight to ten feet, thinned to sixteen feet, tree from tree, bringing the whole into the same distances, at which, in this bare exposed situation, they may stand as a finished plantation. As it is properly enclosed, and should always be kept so, the ground should be kept full of Oak for underwood, which may be regularly cut for Coppice, at same time it will be found extremely useful in rearing up a tree or trees to supply the place of any of the old ones that may be broke by storm or otherwise destroyed. The Oak, Natural Wood, or Coppice on this farm is, for the most part, very thriving; where the stools have been partially thinned, they will require no more till it comes again of age for cutting. There are in many places a great deal of Birch, Alder, and even Larch Firs almost put into the very heart of Oak Stools, which was a most injudicious and ruinous method of planting, as they tend to extirpate the Oak Stool, which is by far the most profitable crop; a very great improvement may be made in the Oak Stools before cutting time, both as to wood and bark, by going carefully through, and cutting all such Birch, Alder, and Larch Firs, or any other tree that is over-topping or in the least injuring the Oak Stools, this should be done immediately, particularly before the sap rises in the Oak, even the fine Oak Stools surrounding the small fields of Auchedroch, notwithstanding their easy access, are much annoyed with trash of this kind, a few open casts cut through some of the marshy places here to let off the surface water, would much improve the Oak Stools before cutting time, from the descent of the ground this could be very easily done; observe, I do not mean draining at present, but only small open casts or ruts on the surface, merely to make the surface water run off, keep one course, and not

lodge amongst and run through all the Oak Stools; observe the same through all the Coppice on this farm where wet.

LXX.

Culnashennaig Farm.

THE whole of the Wood, both planted and natural, on this farm, is very healthy and thriving, and had the Oak Coppice Stools been thinned in time, it would have been equally productive with any wood of the kind in Scotland at its age, both as to wood and bark. I may here observe by the way, that all Oak Coppice Stools should be thinned out the year after being cut for the first time, as by allowing the whole of the shoots to remain till the age of ten, twelve, or fourteen years, the whole becomes stinted and unproductive, and in some cases, many of the Stools die away altogether, and many more never get out of the reach of cattle when they are let into the wood; whereas, when thinned in time, the principal shoots get out of the reach of cattle before the time of letting them in; early thinning should be most particularly attended to, see this fully explained in my Forester's Guide. The whole of the woodland on this farm is excellent, both as to soil and situation for a natural Oak Wood, and nothing will ever pay the proprietor better; but the delightful prospect of this farm, and from its commanding eminence, renders it an object more worthy of ornament than profit, and nothing in nature could more effectually accomplish this purpose, than by clothing its face with clusters of standing ornamental timber trees, which, if properly and tastefully laid out, would not only add immense beauty and value to the farm, but to the whole surrounding country for many miles.

The plan to be pursued with the present crop on the ground is, that the trees about and above the bridge at the mill, should be singled out to standing timber trees, up the river side, on both

sides, to where the Coppice ascends the hill, carefully selecting the best of the trees at sixteen feet length ways, to stand, and as the strip is but narrow on this side the river, they may stand at from eight to twelve feet the deep way, always taking special care to have the trees standing in the gape in a triangular manner, so as not to whip each other in the top; when there are stools of Oak or Ash, two or not exceeding three shoots may be left, in the meantime particularly, where they hang over the water; passing up the water side towards Garbertmore; there is for a long way nothing but Larch Firs, and which, for the most part, are very thriving at present, but so remarkably thick on the ground, that it is altogether impossible they can stand much longer in their present state, the ground is so loose about their roots that a person could push them out by the root with the hand; when plantations are allowed to remain long in this state, mortification often takes place amongst the roots, which spills the whole plantation, there has been some hardwood plants put in here, but these are completely extirpated. In this low lying sheltered place where we are now treading, I have no doubt but Larch Firs would come to maturity as timber trees, for which purpose a few may be reared, although they never will come to be so profitable as Oaks; this part of the plantation should be immediately thinned out to not more than from eight to ten feet, tree from tree, that is, not less than eight nor more than ten, and when this is done, a plant of Oak should be put in betwixt each of the Larch Firs; in about six or eight years after, another thinning should be given, when it must be directed chiefly by the healthy and unhealthiness of the trees, leaving, as aforesaid, a few of the healthy Larch to be reared up to maturity in the sheltered places, taking out at this time generally, another Larch betwixt each two, and put in an Oak. The most of the natural Oak stools on this farm requires a thinning, and if judiciously done, they will

be much benefited by it before cutting time, both as to the quantity of wood and bark; they should also be relieved of trash of Birch, Alder, Hazel, and Larch Firs, the same as directed in the other two farms. There is also a number of Ash stools on this farm, as well as on some parts of the others, all which should get a considerable thinning, leaving only three, or not exceeding four shoots on one stool, so as their wood may come to be of some value as timber by cutting time, and which will greatly improve the growth of it, if properly managed, relieving them also of all trash. The thinning of the trees at and above the Bridge;—on this farm the cutting of the large Firs and other trees in the old clump or Barnellian farm, and clearing the Oak and Ash stools of all rubbish and trash, as aforesaid; this should be done before spring, that is to say, before the sap begins to rise, say before the first of April, when the thinning and barking of the Larch Firs should begin.

LXXI.

Barnegaul and Gloster Farms.

In different places of these farms are excellent land for planting, which would be very productive and profitable in wood, and is good for nothing else; but not being instructed to take notice of any new land, for the present I will pass it over. On these farms there are many unenclosed natural stools of Oak, which prove to a demonstration, that these farms have been at one time much better covered with wood than they are now; notwithstanding their unprotected state, there are a great many Oak stools, from which timber trees could be reared as single standing trees, and that too without taking a single foot of ground from the farm, and to have such trees in these places, is an acquisition of the very greatest importance, not only on the above farms, but on all the others; but particularly here,

and on the easter part of Culnashennaig, taking all these places together; I mean only the unenclosed stools which are totally without and unconnected with any of the Coppice enclosures or boundaries, from two to three thousand trees could be reared, say from some of the stools two, and not exceeding three trees from any of them, which will take little trouble in rearing, besides beautifying in a superb degree those naked places, they will in twenty years be worth at least L.2000 Sterling, in forty years, upwards of L.6000 Sterling, and that without taking one foot of land off the farms. I beg to call the proprietor's particular and immediate attention to this, all that is requisite is, to go through such stools, and carefully select the proper shoots to be reared up for trees, and cut away all the rubbish from off the stool, so as they may get all the nourishment possible, and a very great many of these that are already far advanced will get out of the reach of cattle the first year's growth: But such of them as have bad tops and rerequire to be cut over, must be enclosed single for three or four years, till they be out of the reach of cattle, this is simple, easily and effectually done, by four or six stobs, and these warped close with the small prunnings of Larch Firs, which will prevent them, for six or eight years, from either cattle or sheep; as there is plenty of this kind of rubbish on the farm, two men will do one hundred of such stools in a day, or nearly so, so that the expense is not worth mentioning, and at all stages, and every year of their growth they are adding five times more than their intrinsic value as timber, to the estate or farms. For the proper method of rearing all such, consult my Forester's Guide on converting natural stools into standing timber trees.

LXXII.

——— *North and West Belt.*

This Belt, commencing at the West Lodge, running west-

wards along the public road side, has been thinned; but I am sorry to say, by no means with that care and attention that a belt of trees occupying such a conspicuous place for ornament and shelter as this does on the estate, ought to have been. Before beginning to thin a plantation of any kind, but particularly at such an advanced age as this, a consultation, as it were, should be held within the Forester's own breast before putting a mark or an axe to any tree in any plantation, deliberately asking himself for what future purpose or design is this plantation intended, is it to rear trees to maturity to be cut down that will bring the most money to the estate, or is it to rear trees to stand for generations on the ground, chiefly for ornament? And here in all cases, but in the latter case particularly, the proprietor should be consulted. Here it must be obvious to the most ignorant in the profession of Forestery, that a different treatment is requisite. In so far as the thinning of this belt of planting has been proceeded in, I am at a loss to discover what has been the design; sometimes and in different places, the most ornamental, long lived, and healthy trees have been taken, and a few polish trees left that never will be either ornamental or profitable; in many other places the reverse has been the case, and upon the whole, the belt has been very carlessly dealt with; so carless in some instances has the cutting been proceeded with, that the very tree cut has been allowed to destroy the one it was intended to relieve, and apparently without any attempt being made to save it. As this belt is certainly very ornamental on this part of the estate and should be reared as such, and trees arrived at such an age when cut down cannot be reared up in a life time; no one will deny that deliberation in marking, and care to preserve the standing trees in cutting is truly necessary. This belt will require to be correctly gone over again, and take way the polish trees of Ash and Oak, such as never will come to be trees, and dress up their stools for grow-

ing, so as trees may be reared up from them; fill up all blanks with Spanish Chesnut and Spruce Firs, to give a variety to the look of the belt as well as embellishment and shelter.

LXXIII.

——— *Farm.*

The two young strips of planting on this farm, planted in 1815, is at present full and very thriving. I am still at loss to discover the design of planting the Larch and Scotch Firs in small groups across the strip; had the designer but cast a single glance to some of the strips on this estate planted thirty years ago, where the same plan is adopted, it would have spoken more than volumes, the impropriety of such a plan. In almost the whole of such strips, the Larch are falling into decay, and the strips and belts showing numerous melancholy instances of gapes and blanks through them. As I had occasion often to observe before, this is not at all a soil nor situation for Larch Firs; as soon as it can be overtaken, say next season if possible, the Firs should be thinned out to ten feet, plant from plant, and Oak, Spanish Chesnut, and Plane be put in betwixt them; after these plants are six feet high, the whole Larch Firs may be cut, but some of the Scotch Firs may be reared up. The old clump of Firs on this farm is dreadfully exposed, in which case, nothing can be thinned out of it, but allowed to thin itself, take away the trees as they die, fill up blanks with the aforesaid hardwoods.

LXXIV.

——— *Young Planting.*

This young planting on the south side of the road is filled up with too many Larch Firs. These are arrived at a fine

height and age for thinning out, and planting hardwoods amongst them; thin them out to six feet, and plant in Oak, Spanish Chesnut, Elm, and Plane betwixt each alternately. Sheep have also been in this planting. I cannot pass over this planting without noticing a most ignorant method used through the whole of the young plantations, of planting and protecting the young hedges, which is the great mean of their never coming to be proper fences, the plan most frequently adopted, at least on the one side is, as is the case here, the paling is drove up the inside of the hedge, and the hedge is either left out next to the field to be pastured, or on the road side unprotected, and of course, the hedge is exposed to cattle and sheep, either treading it down with their feet or eating the grass from its roots, either of which, particularly the breath and wool of sheep is equally ruinous to young hedges. This mode of procedure is like a man buttoning his greatcoat behind his back, to protect his belly from the storm. With equal ease and the same expense, the paling can be put up betwixt the hedge and the pasture field or public road, and then it protects alike the young hedge and the planting. This is one reason why so many of the hedges are such pitiful fences on this estate, and so full of gapes.

LXXV.

Fir Plantation.

This plantation, consisting wholly of Scotch Firs, is for the most part in a very thriving state, considering the little attention that has been all along paid to it; this can only be accounted for from the excellency of the soil for rearing wood. I may here observe, that the whole within the boundaries of this plantation, is capable of rearing to maturity almost every kind of timber trees. Had it been planted with Oak in place of Scotch Firs, it would by this time have been paying the

ing, so as trees may be reared up from them; fill up all blanks with Spanish Chesnut and Spruce Firs, to give a variety to the look of the belt as well as embellishment and shelter.

LXXIII.

——— *Farm.*

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LXXIV.

——— *Young Planting.*

This young planting on the south side of the road is filled up with too many Larch Firs. These are arrived at a fine

height and age for thinning out, and planting hardwoods amongst them; thin them out to six feet, and plant in Oak, Spanish Chesnut, Elm, and Plane betwixt each alternately. Sheep have also been in this planting. I cannot pass over this planting without noticing a most ignorant method used through the whole of the young plantations, of planting and protecting the young hedges, which is the great mean of their never coming to be proper fences, the plan most frequently adopted, at least on the one side is, as is the case here, the paling is drove up the inside of the hedge, and the hedge is either left out next to the field to be pastured, or on the road side unprotected, and of course, the hedge is exposed to cattle and sheep, either treading it down with their feet or eating the grass from its roots, either of which, particularly the breath and wool of sheep is equally ruinous to young hedges. This mode of procedure is like a man buttoning his greatcoat behind his back, to protect his belly from the storm. With equal ease and the same expense, the paling can be put up betwixt the hedge and the pasture field or public road, and then it protects alike the young hedge and the planting. This is one reason why so many of the hedges are such pitiful fences on this estate, and so full of gapes.

LXXV.

Fir Plantation.

This plantation, consisting wholly of Scotch Firs, is for the most part in a very thriving state, considering the little attention that has been all along paid to it; this can only be accounted for from the excellency of the soil for rearing wood. I may here observe, that the whole within the boundaries of this plantation, is capable of rearing to maturity almost every kind of timber trees. Had it been planted with Oak in place of Scotch Firs, it would by this time have been paying the

estate, at the rate of L.7 10s. per acre, of annual rent. And I am perfectly aware, that to convert it still into an Oak Wood, —say to cut every twenty-four years as a Coppice it will pay better. This could easily be done, by disposing of, and cutting down the Firs, which could be disposed of as prop-wood, &c. If such a plan was to be adopted, I would recommend that a belt of the Firs round the outside be left,—say not less than one hundred feet wide. This would still keep up the look of it as a plantation, and cover the naked look of that part of the estate, as well as afford shelter to the interior of the Coppice, as every inch of the ground, besides some more waste land that could with propriety and advantage be added, will carry natural Oak Wood as Coppice, if I may be allowed the term, to perfection. Nothing will ever pay the estate better, and that too, producing a regular annual rental for all time coming, without any expense but the first planting with Oak, the expense of which, the present crop would do much more than pay, it being already well enclosed. But let us take the present crop as on the ground, and here the ground, as aforesaid, will carry the Firs to full maturity as timber trees; still these will only improve and increase in value for forty years, not exceeding that time, when they will then fall off in value, and of course, require to be all cut over; nor will they increase in value to that degree to pay any thing like a fair rental for the ground they occupy. The rearing up of these trees too will be attended with some difficulty, from the long neglected state of thinning; still thinning is actually necessary, as there is evidently a great many more trees on the ground than it can afford nourishment for, so that in a very few years the whole will become stinted in the growth for want of nourishment, as is evidently the case already in some particular places. It is therefore necessary, to preserve any thing like a crop of thriving trees on the ground, that the whole be thinned out immediately, and this must be done with the greatest care and attention,

as in many places where the ground is so over-burdened, it has become so loose, that the trees will be easily blown over, so that the cure will become worse than the disease; but to prevent this, the thinning must be proceeded with gradually,—say the first thinning, take away all the worst and most unthrifty of the trees, thinning out to about eight feet, or as near as can be, tree from tree. Allow it to stand with this thinning for five years longer, when the trees will have firmed in the roots, and will admit of another thinning, when they may be thinned out to sixteen feet, tree from tree, or as near as can be, when the thinning will be of considerable value. Take care to leave always the most healthy and thriving of the trees, at which distance they may stand till they arrive at maturity; take away always such trees as die before the timber of them be useless. If this plantation is allowed to stand in its present state, much longer,—say for a few more years, it will extirpate itself, as it is plain to a demonstration, that the trees are killing each other and the whole will soon be stinted in their growth. The thining should be set about as soon as possible, and proceeded in with the greatest caution, skill, and diligence. It is proper to observe, that the trees to be taken out should be most carefully marked off by the hands of the Forester, and taken down under his superintendence. If the proprietor thinks it advisable to rear the present crop after the thinning is finished, a considerable rental should be got for the grass of the plantation for cattle wintering, which will do no harm to the trees; but no sheep should ever be admitted at any time.

This part of the plantation which is wholly of Scotch Firs, occupies very fine land for rearing wood of every description, and from the situation it occupies, it is not so useful either for shelter or ornament to the estate as many of the other Fir Plantations. I am therefore fully of opinion it should be turned into that which would be most advantageous and profitable for

the estate. I am also well aware that the present crop on the ground will not be of more value to the estate although allowed to stand for eight or ten years longer. I must here observe, by the way, that there is a certain size that Scotch Fir will arrive at, when their intrinsic value as timber is as much as when the trees have got eight or ten, or more years growth, and when they may have arrived at a larger size. To explain this I mean when the trees arrive at a size proper for prop-wood, when they are rather too large for this purpose, and not large enough for cutting into deals, then they are only of the same value as prop-wood, and indeed scarcely as much, as they are only at this stage of their growth fit for that purpose and nothing else, they are more clumsy and cost more in carriage and freight which rather diminishes their value. To dispose of the wood on this plantation just now, it will bring more money and meet with a more ready market than if allowed to stand for ten years longer. The most advantageous method with this plantation, both for the present and future good profit and advantage of the proprietor and the estate, is to sell the present crop, and plant it up with Oak, converting it into a natural Oak Coppice Wood, for which purpose it is admirably adapted, both as to soil and situation, as every inch of the ground will carry Oak Coppice; it will pay at the rate of L.7 10s. per acre for all time coming, and as it is nearly all well enclosed, there is only the expense of planting required. The best and most advantageous method of disposing of the present crop would be to divide it into lots or haggs of yearly cuttings, say into five or six lots or haggs; advertise and sell it by roup, binding the purchaser to cut and clear a lot annually, beginning at the westward, and annually cutting a lot; and when cut, plant up with Oak, marking off these lots in straight lines across the narrow way, and then planting up the cut lot, which should be attended to yearly after the cuttings. There can be a temporary fence run across betwixt the cut and uncut planting, to protect

the young planting till the next lot is cut, and so on throughout the whole. Observe, that in planting up the haggs, the whole must be planted with Oak at eight feet distant, plant from plant; in some of the exposed, or very bare places, a Larch Fir may with propriety be put in as a nurse tree betwixt every Oak, only till the Oak gets about six feet high, when the Larch should be cut out. Before making the sale, it will be proper to have the lots marked off, and a value put on each lot, either for the upset-price, or for making an offer for the property in case of combination amongst the offerers, and if there is a demand, and likely to bring its value, the more lots sold in one year so much the better; should the proprietor think proper to adopt this plan, there should not be a day lost in advertising and selling the wood preparatory to planting. Should the proprietor think it proper to rear it up as a Fir Plantation, it should be immediately thinned out from eight to ten feet, tree from tree, and in five years after, to about sixteen feet, tree from tree, and the remaining Fir trees allowed to stand to maturity; but this plan never will pay the estate one pound in seven that the natural Oak will do, I would therefore call the proprietor's immediate and particular attention to converting it into an Oak Coppice, &c.

Experiment.

JUNE 2, 1827.

DEAR SIR,—I have made an attempt to ascertain whether the common Scotch Bark, or the Turkey Oak bore the greater weight of Bark; which I have compared, with as much exactness as I could, and I hope the result will be satisfactory.

I selected trees of each sort, which to appearance had the same chance of growing,—their health, exposure, and the soil they grew in being the same; of the same age, (16 years,) and each pair admeasuring the same over the Bark. The common

Oak Bark lost seven-eighteenths of its weight when green, in drying: The Turkey Oak Bark lost eight-eighteenths, and weighed, when dry, from one-sixteenth to three-sixteenths, or at an average, about one-eight more than the common Oak Bark.

Wishing to know the relative value of each kind of Bark, I took 480 grains of the dry Bark, and proceeded to ascertain the quantity of Tannin, or the tanning principle contained in each kind, by Sir Humphrey Davy's method.—See his Elements of Agricultural Chemistry, 2nd. Edition, page 91.

I found the above quantity of common Oak Bark to contain 86 grains of Tannin: And the same quantity of Turkey Oak Bark to contain 28 and four-fifth grains of Tannin. So that when the common Oak Bark is worth L.9 per ton to the Taner, the Turkey Oak Bark is only worth about L.7 per ton.

From the above experiment it appears that the Bark from an acre of common Oak, is nearly one-tenth more valuable, than from an acre of Turkey Oak. Notwithstanding this difference of value however, I am of opinion that in particular situations, such as well sheltered places, where the soil is of a light sandy nature, it might be more profitable to plant such places with Turkey Oak instead of common Oak. As from the rapidity with which the Turkey Oak shoots forth, in such situations, above the common Oak, I would suppose that it might probably turn out double the weight of Bark.

I will feel much obliged by your remaks on the above at your convenience, and remain,—

Dear Sir,
Your most obedient Servant,
James Gow, Jun.

To Mr. Monteath.

As the Turkey Oak has been but lately planted to any extent in this country, I have not been able to make any experi-

ment on the utility of either its Bark or Timber; but shall not fail to do so as soon as an opportunity offers. In the meantime I consider the above Letter as too valuable to be withheld from the public. It appears that the Turkey Oak, in point of strength, has the same Tannin principles as the Spanish Chesnut; but I am also well aware that the Spanish Chesnut possesses many valuable advantages over the Turkey Oak, both as an ornamental and timber tree; and it can also be propagated by layering, as the common Oak, although I have pursued a system of layering from the Spanish Chesnut for these number of years with success, and can give many proofs of it; yet many of the Nursery gentlemen, whose judgment and experience, one would be led to think, should incline them to draw a very different conclusion, will not admit of it. A very stubborn and incontrovertible proof of it came to my knowledge a few days ago, and which I saw: There is on the estate of Riccarton, the property of J. Gibson Craig, Esq. about six miles west from Edinburgh, a very large old Spanish Chesnut tree, which had two bodies or trunks a little above the ground, and it is plain had sprung from one root; but one of the sides is now fallen totally into decay; at one time it must have girthed upwards of twenty feet above the ground; the healthy part of this tree is still sending out most luxurious branches, extending upwards of 200 feet round; many of these branches bending downwards to the ground have of themselves taken root, and are sending up most beautiful young trees. The aged parent, as if loath to leave the princely mansion on the one side, and a flower garden on the other, is rearing up a numerous progeny, and exposing them in a situation to propagate the name to generations yet unborn. I would advise all who attempt to deny the layering system, to go and see this tree; it is also worthy a visit from all the curious lovers

and on the easter part of Culnashennaig, taking all these places together; I mean only the unenclosed stools which are totally without and unconnected with any of the Coppice enclosures or boundaries, from two to three thousand trees could be reared, say from some of the stools two, and not exceeding three trees from any of them, which will take little trouble in rearing, besides beautifying in a superb degree those naked places, they will in twenty years be worth at least L.2000 Sterling, in forty years, upwards of L.6000 Sterling, and that without taking one foot of land off the farms. I beg to call the proprietor's particular and immediate attention to this, all that is requisite is, to go through such stools, and carefully select the proper shoots to be reared up for trees, and cut away all the rubbish from off the stool, so as they may get all the nourishment possible, and a very great many of these that are already far advanced will get out of the reach of cattle the first year's growth: But such of them as have bad tops and rerequire to be cut over, must be enclosed single for three or four years, till they be out of the reach of cattle, this is simple, easily and effectually done, by four or six stobs, and these warped close with the small prunnings of Larch Firs, which will prevent them, for six or eight years, from either cattle or sheep; as there is plenty of this kind of rubbish on the farm, two men will do one hundred of such stools in a day, or nearly so, so that the expense is not worth mentioning, and at all stages, and every year of their growth they are adding five times more than their intrinsic value as timber, to the estate or farms. For the proper method of rearing all such, consult my Forester's Guide on converting natural stools into standing timber trees.

LXXII.

——— *North and West Belt.*

This Belt, commencing at the West Lodge, running west-

wards along the public road side, has been thinned; but I am sorry to say, by no means with that care and attention that a belt of trees occupying such a conspicuous place for ornament and shelter as this does on the estate, ought to have been. Before beginning to thin a plantation of any kind, but particularly at such an advanced age as this, a consultation, as it were, should be held within the Forester's own breast before putting a mark or an axe to any tree in any plantation, deliberately asking himself for what future purpose or design is this plantation intended, is it to rear trees to maturity to be cut down that will bring the most money to the estate, or is it to rear trees to stand for generations on the ground, chiefly for ornament? And here in all cases, but in the latter case particularly, the proprietor should be consulted. Here it must be obvious to the most ignorant in the profession of Forestery, that a different treatment is requisite. In so far as the thinning of this belt of planting has been proceeded in, I am at a loss to discover what has been the design; sometimes and in different places, the most ornamental, long lived, and healthy trees have been taken, and a few polish trees left that never will be either ornamental or profitable; in many other places the reverse has been the case, and upon the whole, the belt has been very carlessly dealt with; so carless in some instances has the cutting been proceeded with, that the very tree cut has been allowed to destroy the one it was intended to relieve, and apparently without any attempt being made to save it. As this belt is certainly very ornamental on this part of the estate and should be reared as such, and trees arrived at such an age when cut down cannot be reared up in a life time; no one will deny that deliberation in marking, and care to preserve the standing trees in cutting is truly necessary. This belt will require to be correctly gone over again, and take way the polish trees of Ash and Oak, such as never will come to be trees, and dress up their stools for grow-

ing, so as trees may be reared up from them; fill up all blanks with Spanish Chesnut and Spruce Firs, to give a variety to the look of the belt as well as embellishment and shelter.

LXXIII.

——— *Farm.*

The two young strips of planting on this farm, planted in 1815, is at present full and very thriving. I am still at loss to discover the design of planting the Larch and Scotch Firs in small groups across the strip; had the designer but cast a single glance to some of the strips on this estate planted thirty years ago, where the same plan is adopted, it would have spoken more than volumes, the impropriety of such a plan. In almost the whole of such strips, the Larch are falling into decay, and the strips and belts showing numerous melancholy instances of gapes and blanks through them. As I had occasion often to observe before, this is not at all a soil nor situation for Larch Firs; as soon as it can be overtaken, say next season if possible, the Firs should be thinned out to ten feet, plant from plant, and Oak, Spanish Chesnut, and Plane be put in betwixt them; after these plants are six feet high, the whole Larch Firs may be cut, but some of the Scotch Firs may be reared up. The old clump of Firs on this farm is dreadfully exposed, in which case, nothing can be thinned out of it, but allowed to thin itself, take away the trees as they die, fill up blanks with the aforesaid hardwoods.

LXXIV.

——— *Young Planting.*

This young planting on the south side of the road is filled up with too many Larch Firs. These are arrived at a fine

height and age for thinning out, and planting hardwoods amongst them; thin them out to six feet, and plant in Oak, Spanish Chesnut, Elm, and Plane betwixt each alternately. Sheep have also been in this planting. I cannot pass over this planting without noticing a most ignorant method used through the whole of the young plantations, of planting and protecting the young hedges, which is the great mean of their never coming to be proper fences, the plan most frequently adopted, at least on the one side is, as is the case here, the paling is drove up the inside of the hedge, and the hedge is either left out next to the field to be pastured, or on the road side unprotected, and of course, the hedge is exposed to cattle and sheep, either treading it down with their feet or eating the grass from its roots, either of which, particularly the breath and wool of sheep is equally ruinous to young hedges. This mode of procedure is like a man buttoning his greatcoat behind his back, to protect his belly from the storm. With equal ease and the same expense, the paling can be put up betwixt the hedge and the pasture field or public road, and then it protects alike the young hedge and the planting. This is one reason why so many of the hedges are such pitiful fences on this estate, and so full of gapes.

LXXV.

Fir Plantation.

This plantation, consisting wholly of Scotch Firs, is for the most part in a very thriving state, considering the little attention that has been all along paid to it; this can only be accounted for from the excellency of the soil for rearing wood. I may here observe, that the whole within the boundaries of this plantation, is capable of rearing to maturity almost every kind of timber trees. Had it been planted with Oak in place of Scotch Firs, it would by this time have been paying the

estate, at the rate of L.7 10s. per acre, of annual rent. And I am perfectly aware, that to convert it still into an Oak Wood, —say to cut every twenty-four years as a Coppice it will pay better. This could easily be done, by disposing of, and cutting down the Firs, which could be disposed of as prop-wood, &c. If such a plan was to be adopted, I would recommend that a belt of the Firs round the outside be left,—say not less than one hundred feet wide. This would still keep up the look of it as a plantation, and cover the naked look of that part of the estate, as well as afford shelter to the interior of the Coppice, as every inch of the ground, besides some more waste land that could with propriety and advantage be added, will carry natural Oak Wood as Coppice, if I may be allowed the term, to perfection. Nothing will ever pay the estate better, and that too, producing a regular annual rental for all time coming, without any expense but the first planting with Oak, the expense of which, the present crop would do much more than pay, it being already well enclosed. But let us take the present crop as on the ground, and here the ground, as aforesaid, will carry the Firs to full maturity as timber trees; still these will only improve and increase in value for forty years, not exceeding that time, when they will then fall off in value, and of course, require to be all cut over; nor will they increase in value to that degree to pay any thing like a fair rental for the ground they occupy. The rearing up of these trees too will be attended with some difficulty, from the long neglected state of thinning; still thinning is actually necessary, as there is evidently a great many more trees on the ground than it can afford nourishment for, so that in a very few years the whole will become stinted in the growth for want of nourishment, as is evidently the case already in some particular places. It is therefore necessary, to preserve any thing like a crop of thriving trees on the ground, that the whole be thinned out immediately, and that this must be done with the greatest care and attention,

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This part of the plantation which is wholly of Scotch Firs, occupies very fine land for rearing wood of every description, and from the situation it occupies, it is not so useful either for shelter or ornament to the estate as many of the other Fir Plantations. I am therefore fully of opinion it should be turned into that which would be most advantageous and profitable for

the estate. I am also well aware that the present crop on the ground will not be of more value to the estate although allowed to stand for eight or ten years longer. I must here observe, by the way, that there is a certain size that Scotch Fir will arrive at, when their intrinsic value as timber is as much as when the trees have got eight or ten, or more years growth, and when they may have arrived at a larger size. To explain this I mean when the trees arrive at a size proper for prop-wood, when they are rather too large for this purpose, and not large enough for cutting into deals, then they are only of the same value as prop-wood, and indeed scarcely as much, as they are only at this stage of their growth fit for that purpose and nothing else, they are more clumsy and cost more in carriage and freight which rather diminishes their value. To dispose of the wood on this plantation just now, it will bring more money and meet with a more ready market than if allowed to stand for ten years longer. The most advantageous method with this plantation, both for the present and future good profit and advantage of the proprietor and the estate, is to sell the present crop, and plant it up with Oak, converting it into a natural Oak Coppice Wood, for which purpose it is admirably adapted, both as to soil and situation, as every inch of the ground will carry Oak Coppice; it will pay at the rate of L.7 10s. per acre for all time coming, and as it is nearly all well enclosed, there is only the expense of planting required. The best and most advantageous method of disposing of the present crop would be to divide it into lots or haggs of yearly cuttings, say into five or six lots or haggs; advertise and sell it by roup, binding the purchaser to cut and clear a lot annually, beginning at the westward, and annually cutting a lot; and when cut, plant up with Oak, marking off these lots in straight lines across the narrow way, and then planting up the cut lot, which should be attended to yearly after the cuttings. There can be a temporary fence run across betwixt the cut and uncut planting, to protect